TRAFFIC QUARTERLY

AN INDEPENDENT JOURNAL FOR BETTER TRAFFIC

APRIL 1951

Editorial
Small Town Parking
'Drunk Drivers Go to Jail'
Enforcement and Traffic Control
Transportation and Retail Business
Adequate Parking for Business Areas
Traffic Data for Highway Administration
Traffic Factors in Urban Planning
Retail Merchants and Business
Urban Intersection Problems
Let Them All in the Act
Parking Problems

THE ENO FOUNDATION FOR HIGHWAY TRAFFIC CONTROL

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An Editorial

BY THIS time, each state and community should be far along in preparation or completion of its civil defense program.

Traffic control must form an important part of any plan to meet trying and unusual situations of evacuation, medical aid, transportation of supplies, and uninterrupted support of Federal Defense measures.

Governors have broad powers to formulate and execute plans to regulate and control traffic. State executives and other state officials concerned with traffic matters are qualified to provide competent assistance.

They are aware of increased difficulties because of shortages in manpower, critical materials, and priorities in war production. These arise from national defense measures and should come first.

Under assumed conditions of enemy attack, internal sabotage, inability to determine precisely the point of greatest menace, along with a lack of familiarity with major emergency situations, we face a task that warrants the interest and cooperation of every good citizen.

The assignment challenges every state.

Highways, traffic control measures, and driver behavior seldom meet situations of a similar but not critical nature. Bad weather, ceremonies, athletic events and week-end travel create difficult traffic tie-ups familiar to all of us.

The problem for every community is difficult and different and should not be put aside with any feeling that present measures and practices will suffice.

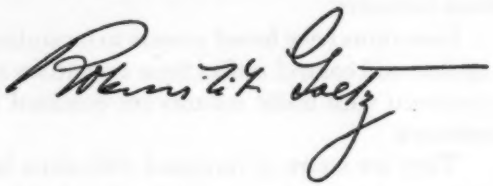
No one will concede that we have been able to demonstrate our ability to satisfactorily solve our daily normal traffic problem. Evidence is our continued effort and our annual high accident and death rate.

Without a reasonable degree of understanding by the driver, an appreciation of his important part in the problem and without his fullest and complete cooperation, the best-made plans are fraught with failure.

No amount of imagination, no amount of contemplation and serious thought to provide the utmost in flexibility or restrictive measures for its efficient execution can contribute so much to its success as better driving by the driver.

This necessitates his willingness, his best endeavor and complete support.

No community can contribute more than by the prompt initiation of a drive for better driving while there is time.



The Retail Merchant's Interest in the Traffic Problem

GEORGE J. EBERLE

Mr. Eberle heads the Eberle Economic Service which has made more than 200 major surveys since its organization in 1916. From 1910 to 1914, Mr. Eberle was case investigator for electric railways as a member of the Wisconsin Railroad Commission. From 1915 to 1918, he was a member of the University of Wisconsin faculty, teaching Transportation, Public Utilities and other economic subjects. From 1921 to 1929, he was a member of the Economics faculty of the University of Southern California. From 1930 to 1939 he was a commercial engineer. From 1933 to 1939, he was identified with governmental simplification and charter revision in California. He has contributed articles on economics to scholarly and professional journals.

IN URBAN and suburban business districts the retail merchants as a group are proportionately large generators of vehicular and pedestrian traffic. This was brought out in a recent survey of twenty classes of establishments in ten business districts in a city of over 100,000 population serving a marketing area of 500,000 inhabitants. According to the record[1] the retail stores had the predominant share, about three-fourths, of the average daily patrons coming by all means of transportation.

A summary of the patrons to the first five classes of establishments in the following Table 1 — namely, purveyors of food and drink; apparel for men, women and children; household goods; gasoline filling stations; and miscellaneous retail stores — the total average of daily patrons to these five classes was 205,867 out of a total of 274,637, or 75 per cent. If gasoline filling stations are excluded, the remaining four classes of retail stores still have more than 70 per cent of the patrons. These four classes make up the bulk of the outlets in the usually concentrated business districts, or that is to say, in the congested traffic districts in our urban and suburban centers. In this

[1] Data such as: retail sales and transactions, questionnaire reports and interviews, and estimates based upon this information supplemented by entrance counts and spot checks.

Table I

Patrons Per Average Day of Various Classes of Establishments in Ten Business Districts

Class of Establishment	*Patrons Per Average Day*	
	Number	*Percentage To Total*
Food and Drink	92,113	33.54
Apparel	41,390	15.07
Furniture—Household—Radio	6,322	2.30
Gasoline Filling Stations	12,134	4.42
Miscellaneous Retail Stores[a]	53,908	19.63
Lumber Yards—Contractors—Nurseries	1,588	.58
Personal Services[b]	10,419	3.79
Business Services[c]	2,641	.96
Auto Repair and Service	1,122	.41
Miscellaneous Services[d]	2,602	.95
Professional Services[e]	8,407	3.06
Investment Service	5,288	1.92
Banks	6,527	2.38
Hotels—Clubs, Etc.	4,999	1.82
Theaters—Churches—Auditoriums	8,830	3.22
Amusement	1,629	.59
Manufacturers (Light)	2,567	.93
Wholesalers	1,392	.51
Quasi-public Services[f]	2,779	1.02
Government Services	7,980	2.90
Total	274,637	100.00

[a] Miscellaneous Retail Stores are outlets selling jewelry, luggage, cameras, books and stationery, gifts and novelties, tobacco, flowers, etc.

[b] Personal Services include barber, beauty parlor, cleaning, dyeing, etc.

[c] Business Services include blueprinting, stenography, mimeographing, repairs and service to typewriters and business machines, window washing, etc.

[d] Miscellaneous Services include circulating libraries, furniture repairs, landscape gardening, custom industries, etc.

[e] Professional Services include doctor, dentist, lawyer, engineer, accountant, and others.

[f] Quasi-Public Services include utilities serving water, gas, electricity, telephone, etc.

survey it was found that 160,000 of the patrons, or 60 per cent, were generated by the so-called downtown business center and the balance by the nine satellite districts.

Interviews of a representative number of patrons in this downtown center disclosed that they came there from their homes by the following means of transportation: by auto 56 per cent; by bus 25 per cent; by electric railway 4 per cent; by walking 14 per cent; by taxi and miscellaneous 1 per cent.

It should be observed that the services such as Personal Services (barber, beauty parlor, cleaning, dyeing, etc.) with 10,419 patrons, generate considerable traffic. Adding to this the Professional Services (doctor, dentist, lawyer, etc.) with 8,407 patrons; Auto Repair Service with 1,122; Miscellaneous Services with 2,602 patrons; Investment Service with 5,288 patrons; these five types of services together had less than 28,000 patrons — about 10 per cent of the total, and approximately one-seventh as many as the retail group. The Quasi-public (utilities) Services and the Government Services combined generate only 10,759 patrons, less than 4 per cent.

While the Theater–Church and Auditorium group generate 8,830, or over 3 per cent of the patrons, the bulk of this traffic occurs in the evening or on weekends. The retail outlets and the private and public services, as here defined, generate over 85 per cent of the patrons, and by this measurement probably contribute the major portion of the traffic, both vehicular and pedestrian, to the critical afternoon peak, or "rush hours," in our urban centers.

If any remedies, for instance, such as "staggered hours," are contemplated to reduce or mitigate this afternoon peak, then corrective measures should be progressively applied beginning with the largest traffic generators. Thus the authorities would need the cooperation of the retailers initially, and the services and other generators would follow in order.

Retail Transactions by Means of Transportation

The merchant is naturally interested in bringing as many patrons into his establishment as possible. Every entrant is generally a prospective customer and may become an actual customer. The relation-

ship between entrants and actual customers has been determined in a number of cases. As an example, one successful store clocked all persons entering its building at various times over a period of years and related the number of entrants to the number of transactions. The lowest ratio for a month was 66 transactions per 100 entrants, and the highest was 97 to 100 on a special sales day. A whole month of counts in September produced a ratio of 80 to 100, and a twelve-day sales period produced 82 to 100. With these data as a guide, let us assume an acceptable average of say, 75 sales per every 100 entrants.

One of the primary prerequisites then to a satisfactory volume of business is the number of persons entering the store. But in these days of relatively great distances in our urban centers, most residents usually cannot become entrants, and then customers of a store unless they employ some modern means of transportation such as the motor bus, trolley coach, electric railway, railroad train, automobile or taxi. The merchant should, therefore, know what means of transportation his customers use, and in what proportion they use it, to come to his establishment. This information will enable him, for instance, to ascertain how dependent his volume of business is upon private automobile transportation, or upon various types of mass, or public transportation, etc.

If a large volume of his sales are dependent upon customers who come by automobile, then he immediately should look into the provision of terminal (parking) facilities tributary to his store. If a large volume of sales is generated by riders of public transport then his store should be located so as to be easily accessible on foot by these riders, or that such riders have adequate supplementary transportation to reach his store. He naturally would be interested in the schedules, rates, transfers, headways, stops, etc. to the degree that his customers use the public vehicle.

He should also know over the years whether the proportion of his customers who come by the various means of transportation are increasing or decreasing, respectively. In other words, what is the *trend* of the share of sales coming by automobile, or by public transport, or by those who walk into the store directly from their residences? Not so long ago when our cities were small, the customers came

mainly on foot, and a few came by horse-drawn vehicle and were known as the "carriage trade." The customers coming on foot have decreased markedly with the expansion of our urban centers, and the "carriage trade" has disappeared entirely. In its place is the automobile, the taxi and other private vehicles, while most of the customers who came on foot have of necessity taken to public transportation. In these times, in some areas, those coming by automobile are rapidly increasing, and those coming by public vehicles are decreasing. In a few areas, due to downtown traffic congestion and lack of auto parking, the customers are tending back toward the use of the public carrier, or are transferring their patronage to less congested suburban business districts where there is better street circulation and good parking.

The existing means of transporting customers to patronize a shopping district are in flux. This being true, it confronts the merchant with the problem of looking ahead, or forecasting his future requirements, for instance, for automobile parking or for rapid transit, etc. In the case of parking, it is conceded by many retailers and traffic engineers that the facility, whether a lot, or garage, should be close, or adjacent, to the store. Some surveys show that shoppers shun a walk between car and store of 500 or more feet. More about this later.

If a large steel and concrete garage is needed, there should be scientific estimates of present space required, and say, twenty-year forecasts to gauge the probable requirements in square footage, or number of car spaces, in the future so that sufficient land room and floor space may be provided in time. Over the past thirty years, the writer has found that parking facilities have been underestimated consistently. One store on the Pacific Coast built an adjacent garage with a capacity of 125 car spaces which became wholly inadequate within a few years, and no nearby land was available to build an addition; in another case a new large branch store had to double its original parking space almost immediately after the store opened; and in another case a metropolitan branch store on the Atlantic Coast found it uneconomical to enlarge its original small lot due to high land prices which the location and operation of the store itself had caused.

These and numerous other unfortunate experiences point to the wisdom of making rational forecasts by the retailer to anticipate demand of parking facilities for the surface lot, and especially for costly multi-floor garages whose physical or functional life may be twenty years or more. The power and telephone utilities, and others, have made five, ten and twenty-year forecasts to anticipate demands during the past fifty years with a good measure of success, and there appears to be no good reason why the techniques developed by those enterprises cannot be applied to investments in stores and their parking facilities. In fact, the latter being part of the public transportation system, it is by its very nature a utility.

Such forecasts include, among other things, the prognostication of population growth in the marketing area; automobile registration and use; the probable number of customers; the effect of the prohibition of street parking in the vicinity of the store; one-way streets, etc.; the length of stay and turnover of parkers; changes in the volume of traffic to the store due to new super-highways, and the trend of decentralization or suburbanization of retail trade.

Table II

PROPORTION OF DEPARTMENT STORE TRANSACTIONS GENERATED BY MEANS OF TRANSPORTATION IN VARIOUS CITIES

City	*Mass or Public Transportation*[A] %	*Automobile*[B] %	*On Foot* %	*Total* %
San Francisco	75.3	20.1[a]	4.6	100.0
Oakland	44.5	51.6[b]	3.9	100.0
Sacramento	44.8	47.7	7.5	100.0
Los Angeles	56.0	44.0	—[c]	100.0
Long Beach	44.6	45.8	9.6	100.0
Honolulu	55.2	41.8	3.0	100.0

[A] Mass or Public Transportation includes electric railway, steam railway, cable railway, trolley and motor bus.
[B] Automobile includes auto, taxi, motorcycle, bicycle, etc.
[a] Includes 0.5% transaction of customers coming by taxi.
[b] Includes 0.3% transaction of customers coming by taxi.
[c] Customers coming to the store on foot not counted.

The different types of transportation used by customers to reach retail stores vary to a considerable extent with the general riding

habit of the public. In Table II we have a few results of some of the recent surveys conducted by the writer showing the proportion of customers, (or transactions), who come by mass transportation vehicles, by automobile and on foot, respectively. These surveys covered tens of thousands of customers' purchases on a representative number of days. The information was obtained as the purchases were being made.

In the above table, as measured by transactions, the customers in San Francisco used the mass transportation facilities to the extent of 75.3 per cent, while the automobile produced only 20.1 per cent, and those who came to the store on foot are a minor proportion with only 4.6 per cent. The high proportion of mass transportation used in San Francisco is mainly due to the fact that the major growth of the city took place through the electric and cable railways during the pre-motor age.

Oakland, its sister city across the Bay, expanded mainly with the aid of the automobile. In Oakland, therefore, only 44.5 per cent of the transactions are generated by mass transportation, whereas 51.6 per cent are generated by the automobile. The hilly terrain of downtown San Francisco is not as conducive to easy automobile operation as the flat terrain of Oakland. Most cities in central and southern California have a high usage of the automobile due to the favorable all-year-around weather conditions for its operation.

The study in Los Angeles was taken under World War II conditions when there was rationing of gasoline and tires thus decreasing automobile usage. While the table shows 44.0 per cent of the transactions generated by the automobile patrons, this is about 10 percentage points below normal conditions because in the cordon count of 1941 of the Regional Planning Commission the percentage coming into the downtown business district by automobile was 53. Obviously, the war conditions in Los Angeles raised the percentage of transactions by mass transportation about the equivalent of their loss in automobile traffic. For example, cordon counts were made for Los Angeles downtown business district since 1924 and, eliminating the pedestrians, the mass transportation system brought in 61.5 per cent of those who came downtown in 1924, whereas by 1941 this had been reduced to 38.4 per cent.

When we adjust the automobile transportation percentage of transactions for Los Angeles there appears to be considerable consistency in terms of transactions as to the importance of the automobile to the merchants in the cities for whom these surveys were made with the exception of San Francisco. The percentages range from the low in Honolulu of 41.8 per cent to the high in Oakland of 51.6 per cent, contrasted with the 20.1 per cent in San Francisco.

Retail Sales by Means of Transportation

While transactions are indicative of the importance of the various types of transportation to the retailer, the sales in dollars of the purchases are the best test of the value to the retailer. In Table III we show the percentage distribution of the sales by means of transportation in the six cities. As will be shown later, the income status, or the purchasing power, of the retail customer coming by automobile is higher, as a rule, than that of the customer coming by public vehicle or on foot. In four stores out of six, the auto customer brings in more money, or sales, than the customer coming by public carrier. Even in Honolulu where the transactions by auto are 41.8 per cent of the total, the sales are 47.7 per cent. San Francisco, with only 25.5 per cent, is outstandingly low in the proportion of sales generated by the auto. The highest proportion of sales by those coming on foot is found in Long Beach, California, namely 8.5 per cent.

Table III

PROPORTION OF DEPARTMENT STORE SALES GENERATED BY MEANS OF TRANSPORTATION IN VARIOUS CITIES

City	*Mass Transportation* %	*Auto* %	*On Foot* %	*Total* %
San Francisco	70.3	25.5[a]	4.2	100.0
Oakland	38.6	58.4[b]	3.0	100.0
Sacramento	39.5	54.3	6.2	100.0
Los Angeles	48.0	52.0	—	100.0
Long Beach	39.3	52.2	8.5	100.0
Honolulu	49.2	47.7	3.1	100.0

[a] Includes 0.7% sales to customers coming by taxi.
[b] Includes 0.5% sales to customers coming by taxi.

Sales Per Transaction by Means of Transportation

The differentials in favor of the automobile in sales per transaction as compared with public vehicles are quite marked in each city averaging about 30 per cent or better. In San Francisco the customer coming by public carrier averages a sale per transaction of $5.46, while the auto customer produces $7.41, or a differential of $1.95 or 36 per cent higher. The unit sale of those customers coming on foot is appreciably lower than the unit sale produced by the auto customer as shown in Table IV.

Table IV

Department Store Sales Per Transaction of Customers Coming by Various Means of Transportation

City	*Mass Transportation*	*Auto*	*On Foot*	*Total*
San Francisco	$5.46	$7.41	$5.44	$5.86
Oakland	4.97	6.45	4.36	5.71
Sacramento	3.96	5.10	3.66	4.48
Los Angeles	6.79	9.16	—	7.84
Long Beach	4.82	6.30	4.90	5.45
Honolulu	4.62	5.92	5.83	5.20

Comparatively, these data indicate that the customer coming by auto is the most valuable to the retailer in point of unit sales. To what extent does this justify the encouragement of the auto customer by expending money for parking lots, garages, special exits and entrances, etc.? In the first place, take the downtown department store in our metropolitan centers; the loss of part of the auto trade may result in a much less profitable business. Secondly, extensive surveys conducted in suburban residential areas have shown that if merchandise at the same prices, qualities, selection of styles and sizes were offered in local stores, together with credit, adjustment and exchange privileges, then three-fourths or more of the family shoppers would prefer to buy locally rather than buy downtown. The important objections of the housewife to shopping downtown are "too time-consuming and tiring; crowds; poor transportation; difficult, inadequate and expensive parking; congestion and heavy traffic." On the other hand, the objections to suburban shopping are "poor se-

lection, higher prices, often lack of credit and adjustment facilities." The advantages of downtown shopping are usually the reciprocals of these, and that the downtown centers have better attractions which can be combined with shopping, such as better restaurants, clubs, theaters.

Sales Per Transaction by Where Parked

Generally, it has been found that the customers who park on the street are less valuable to the store in sales per transaction than those who park in the store garage or lot. One extensive test disclosed that the customers who parked in the store garage bought an average of $6.65 per transaction, while those parked on the street averaged $5.65 or $1.00 less.

In another case where the store garage or lot space was inadequate, it was found that many of the best customers (those who often come later in the morning to shop, or early in the afternoon) could not get into the store facility and were forced to park in outside validated or unvalidated lots. Of those who came early and were lucky enough to get into the store lot, the average sale per transaction was $9.33, but a check of those who could not get into the lot and parked in an outside validated lot brought $9.87.

In another case where the parking lot was adequate, the sales per car parked in the store lot averaged $17.85 in total sales from the driver and passengers, and those cars parked outside averaged $14.97.

Of interest to the merchant and apropos to sales per car, it was found in one city that the driver of a car had a higher sale per transaction ($6.90) than the individual passenger ($5.21).

Walking Distance of Parkers to Store

In one case, from the increasing number of customers who parked outside of the store lot, it developed that additional facilities were badly needed. World War II prohibited garage building so the problem was to find additional ground space to accommodate the customers. A survey of over 22,000 customer parkers revealed, as shown in the following Table V, that 75 per cent of the customers parked less than one block (one block = 500 feet) from the various store

entrances, and the total who parked two blocks or less from the store was 96 per cent. As a result, land was purchased and leased opposite the store lot to stay within the customers' preference of two blocks or less of walking.

Table V

WALKING DISTANCE OF CUSTOMERS PARKING OUTSIDE OF STORE LOT

Distance Parked From Store	*Number of Customers' Cars Parked Outside of Store Lot*	*Percentage to Total*
Less than one block	16,653	74.9
One to two blocks	4,684	21.1
Total parked two blocks or less	21,337	96.0
Over two blocks	852	3.8
Indeterminable	49	.2
Total all parkers	22,238	100.0

The question has often been asked whether decentralization or suburbanization of retail trade will eventually destroy the downtown shopping center. Downtown metropolitan stores have several definite sources of shoppers, namely, residents who live close to the downtown stores; transients and tourists living in downtown hotels and apartments, and the daily workers in downtown establishments[2] who do most or some of their shopping in downtown stores.[3] To be added to these three sources of sales is the "list shopper" from the suburbs who compiles a list as current merchandise needs and desires present themselves, and who makes a trip downtown when the list warrants the time, effort and expense. The ultra-discriminating suburban shopper often can not be satisfied until she has examined merchandise in several suburban and downtown stores with the result that on such items as coats, suits, formal dresses, furs, or any item with a high style factor, the downtown stores on a keen competitive basis get some of the suburban business.

[2] In a survey it was revealed by questionnaire of thousands of purchases during a week that 30 per cent of the store's sales came from those who worked downtown.

[3] See "Metropolitan Decentralization and the Retailer," The Journal of Retailing (New York University) by George J. Eberle, Vol. XXII, No. 4, pp. 91–94, Dec. 1946.

In conclusion it may be asked, "How is the large retailer to meet the traffic problem and its corollaries of decentralization and suburbanization?"

Decentralization is the transfer of shopping-goods buying by former customers from the metropolitan downtown center to satellite business districts; and suburbanization may be defined as the development of large multiple and single family suburban residential tracts with sufficient purchasing-power volume to support their own shopping-goods[4] business district and be independent to a large degree of the downtown center. Both detract from the sales of downtown stores and their potential volume.

There are several methods of dealing with the traffic problem of the shopper and the retailer, either directly or indirectly, depending upon location and circumstances. Evidently there is a difference of opinion among merchants as to how to proceed in particular locations. Mr. Rich, President of Rich's Department Store of Atlanta, Georgia, gave his views in the TRAFFIC QUARTERLY. He said in part:

> It is the problem of downtown traffic congestion and the ability of business to take care of the physical mass of its customers.
>
> In the face of this quandary, downtown property owners in every metropolitan city are concerned over the preservation of property values.
>
> Of all these owners, the large retail merchant or department store operator probably has the greatest stake. For in addition to owning from ten to twenty million dollars' worth of real estate, most department stores are dependent on the movement of large masses of people to maintain and improve their sales position in their respective communities.
>
> Large retail stores, particularly in Los Angeles and New York, have run from this problem instead of facing it. They have evaded it by contributing toward the trend of decentralization through opening branch stores in suburban centers. This may alleviate some of the downtown congestion. But from the point of view of the merchant, it is often a mistake.
>
> The function of a large department store—the reason for its being—is its ability to assemble under one roof vast selections of goods at many price points and in many categories, for the convenience of the public. Outlying units are, of necessity, limited in assortment and in the volume potential of sales. This detracts from the Main Store's traffic and helps to depreciate the store's progress and the value of its property. Perhaps, more importantly, these branch

[4] "Shopping goods" such as apparel, furniture and furnishings, specialties, etc., are considered here as distinct from "convenience-goods" such as food, drugs, tobacco, liquor, personal services, which have primarily a local daily demand.

units diffuse the interest, time, attention, and talents of the Main Store's key personnel.

At Rich's this problem must, we believe, be cured where it is instead of where it isn't.[5]

Whether New York or Los Angeles, or any of the larger American metropolitan areas such as Chicago, Philadelphia or Detroit can use the same approach toward the mitigation of traffic congestion and the fight against decentralization as Atlanta or any of the smaller metro areas is open to question. The writer has lived in the Los Angeles metropolitan area since 1920, and his organization has surveyed this area, among other areas, for thirty years. We respectfully submit that the shopping and traffic conditions in the Los Angeles and New York metropolitan areas are not entirely comparable with those of Atlanta, Georgia.

According to the federal population census of 1950, the city of Atlanta had a population of 327,090 while Los Angeles had 1,957,692, and New York 7,835,099. Atlanta city was only 17 per cent as large as Los Angeles and about 4 per cent as large as New York. On the basis of standard metropolitan districts in the same census, Atlanta was given 664,033 population, about 15 per cent of the 4,339,225 credited to Los Angeles metro, and approximately 5 per cent of New York's 12,831,914.

In a suburban marketing area with about 500,000 population, studies of population, family incomes, purchasing power in department store lines, distance from downtown parent store, transportation facilities, and shoppers' needs and demands, and many other facts have revealed that in spite of local chain and independent store sales and downtown parent store competition and drawing power, a large branch store of 200,000 to 300,000 square feet of overall space has usually enough potential sales to warrant the establishment of a complete soft and hard goods lines unit.

Upon these criteria, Los Angeles and New York metropolitan areas can support a number of branch stores, respectively. The tendency in the past has been to build department store branches that were too small, and therefore could not begin to give the sub-

[5] *Traffic Quarterly*, "Merchants and Traffic Congestion," Vol. IV, No. 3, pp. 270–71, July 1950.

urban shopper the variety of goods and the selection required "under one roof."

Comprehensive marketing surveys by large downtown department stores have been conducted for over twenty years in the Los Angeles metropolitan area to determine the economic feasibility of establishing branch stores. These surveys encompassed such factors as time and distance required by shoppers to reach the downtown stores;[6] the probable effect in the future on downtown shopping by limited access super-highways, and better parking; the improvement of the public transit system; the fact that over half the metropolitan population lives outside of a 7.5 mile radial zone from the center of the city; that over 60 per cent of the families live in single family houses scattered over hundreds of square miles of urban and suburban territory; the income status of the suburban families; size of family; the racial, age, sex and occupational distribution of the population; retail sales and shopping-goods' sales per capita in the suburban marketing districts; shopping-goods needs, habits and shoppers' desires; the market coverage, or sales position of the downtown store in the whole metropolitan area and in each suburban marketing area, that is, what percentage of the total shopping-goods sales does the store under review capture in these areas and what is a fair sales potential; the number of stores of various types per thousand population, and many other criteria.

Upon the analysis and evaluation of all such factors, the large merchants of Los Angeles have now established nine large-scale branch stores in the metro area while three are under construction at this writing. These branch stores have developed a profitable business and they embrace in the neighborhood of 2,000,000 square feet of floor space. In addition, there are over ten large Sears branches in the metro area, and numerous apparel, furniture and other competitive chains and independents. The parent stores and their branches have gained in market coverage rather than lost. Other businesses like insurance headquarters, finance companies, management headquarters, the medical profession, have moved to the outlying districts taking thousands of employees and patrons with them.

[6] Many suburban shoppers have to travel from 30 to 50 miles round trip by auto or public vehicle in order to shop downtown in Los Angeles metro area.

In the New York metropolitan area we find similar conditions. For example, the large stores in the central business district have established branches on Long Island, in White Plains, in Parkchester and in East Orange, New Jersey, and in other places. Incidentally, the department store key personnel problems alluded to by Mr. Rich, have not been insurmountable either in New York or Los Angeles. This is a matter of appropriate business organization on a sound basis of economics.

The Los Angeles merchants have found by critical study of all relevant facts and conditions that an investment in floor space, inventories and personnel in branch stores has better potentialities for successful operation than locating the same investment in the central area and thereby attempting to draw all the shoppers to that focal point. Another consideration was the migration of the independent apparel stores to the suburbs. These small units owned little or no fixed property downtown and had no long leases, so they moved to the suburbs and siphoned off a good part of the downtown department store business. For instance, according to the Retail Census of the United States Bureau the sales recorded on the books of the apparel stores decreased from $23,212,000 in 1929 to $10,169,000 in 1939 in the Los Angeles central business district, while during the same ten years the apparel stores in the suburbs increased their sales from $21,657,000 to $38,071,000.[7] The chains competing with the department stores did likewise. The Federal Reserve Bank's index of department store sales (base 1935–1939) had increased over seven fold in one large suburb while the central area index doubled.

Thus, in self preservation, that is, maintaining an acceptable market coverage, the central department stores in Los Angeles found that it was more feasible, so to speak, to bring the store to the suburban customers and the shoppers, rather than expand their central plants and expense to bring the customers to the downtown center. Obviously, the establishment of nine branch stores in operation and those under construction, when finished, will divert much of the traffic and purchasing power from the downtown center to the suburbs where the shoppers, especially by auto, can have facilities

[7] Unfortunately, detailed data by business districts are not available in the Los Angeles area for the 1947 Retail Census.

compatible with the motor age, which is extremely difficult and costly in the downtown centers that were conceived, planned and built during the horse drawn and public vehicle era.

Finally, from the merchants' standpoint, the traffic and parking problems are so interrelated with central and branch store operation and economics that the solution must be approached on the broad basis indicated in the above discussion by the merchant, by the traffic engineer and by the economist. There is no standard solution for all metropolitan areas. In the super metropolitan areas, the civic authorities, the planners, the merchants and other private enterprisers should cooperate to solve the traffic congestion by a multi-sided approach, namely, by improving the central facilities as much as prudently feasible, and by diverting as much of certain downtown traffic and business to the suburbs as conditions permit. In the middle-sized metro areas, the same treatment may be practical except that more emphasis should be placed upon the solution of the downtown conditions. In the smaller metropolitan districts, it may be best to improve the central plant and its operation to the exclusion of any emphasis upon the decentralization of traffic or business. In two recent surveys, the writer, for instance, has recommended against branch stores to his central department store clients and urged the building of the central plant to handle all the business.

In the Los Angeles metropolitan area, at present, there are approximately two million motor vehicles, or one private vehicle for about every two (plus) persons. This coupled with the high usage, or local automobile riding habit, makes it very questionable whether, now or in the future, downtown street and parking facilities could be provided to accommodate, at bearable cost, the traffic generated without further recourse to decentralization.

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The Use of Traffic Data in Highway Administration Work

J. A. ANDERSON

Mr. Anderson has been State Highway Commissioner of Virginia since August 1, 1941. He is President of the American Association of State Highway Officials. For a number of years he was head of the Civil Engineering Department at the Virginia Military Institute. From 1933 to 1936 he served as State Engineer and State Director of U. S. Public Works Administration for Virginia.

IN OCTOBER 1922, a National Conference on Education for Highway Engineering and Highway Transport was held in Washington. Many of the leaders in highway development were there. It was my privilege to attend, and after the proceedings were published I used them as a constant reference. Some of the papers presented showed an amazing grasp of the whole problem of highway transport as well as the interrelationships between highway, motor vehicle and people served.

Arthur H. Blanchard, then Professor of Highway Engineering and Highway Transport at the University of Michigan, discussed "The Trend of Highway Transport Education in the United States." I quote from that farseeing paper of 1922:

"Many highway departments are not properly designing the highways for even immediate future traffic because their personnel does not include men who have had a proper training in highway transport to have a vision and adequate background which will enable them to diagnose the probable development of traffic on a given highway, or, in other words, to make the prerequisite of economic highway design, a highway transport survey, which embodies all investigations in the field and office which are necessary to efficiently estimate the probable amount, character and effects of the future traffic which will use a given highway during the lives of its several component parts. . . .

"In order that highway transport surveys should be properly conducted and adequate provision be made for the economic design, construction and maintenance of highways, *each State Highway Department should create a Highway Transport Division.*

"The duties of the division would be to deal with all matters pertaining to traffic and transportation which affect the economic design and maintenance

of highways and their efficient use by pedestrians and all classes of vehicles. One of the most important functions of such a division would be to make highway transport surveys as preliminary to the design and redesign of state highways, the determination of efficient methods of maintenance, and the formulation of recommendations pertaining to efficient traffic and transport regulations.

"Men assigned to a Highway Transport Division should be experienced highway engineers who have or are rapidly acquiring a knowledge of the following subjects: Highway transport economics, legislation, surveys and methods; highway transport management, including delivery systems, scheduling and routing; traffic regulations; interrelationship of highway, railway and waterway transport; port, terminal and warehouse facilities; and the fundamentals of mechanism and operation of automobiles, motor trucks, tractors and trailers."

Professor Blanchard clearly foresaw the need for Traffic and Planning Divisions of our State Highway Departments.

Dr. W. K. Hatt who in 1922 was Director of the Advisory Board on Highway Research quoted Viscount Bryce: "It is facts that are needed: Facts, Facts, Facts. When facts have been supplied, each of us can try to reason from them."

Dr. Hatt also said, "It is not too much to say that there must be created a new realm of economic data to quiet opinionated discussion of mooted questions in the field of highway transportation."

The Proceedings of that 1922 Conference are recommended for study and meditation. The great pioneers of those days in the field of highway development had messages of interest and value to us in 1951.

So much for the thoughts of nearly thirty years ago.

Principal Responsibilities of the Highway Administrator

The two principal responsibilities of the highway administrator are:

1. Providing maximum highway safety and service for present-day traffic, and

2. Working for the development of a highway network that is free of current deficiencies and that will adequately serve the anticipated traffic of future years.

If the highway administrator is to meet these responsibilities he

must have full and complete traffic data available. The dual responsibilities of traffic and planning are so closely related that in Virginia one of the State Highway Department's six principal divisions has been named the Division of Traffic and Planning.

The major purpose of this division is to compile and analyze the traffic data necessary to assist the highway administrator discharge his dual function—to serve present-day traffic and to plan for the traffic of the future.

Each day the administrator is confronted with problems demanding immediate solution. He has the right to expect assistance from his traffic engineering arm, usually in the form of recommendations firmly founded on facts. The facts stem from traffic data; the recommendations, tempered by experience and judgment, are based on such realities as applicable legislation, availability of funds and the possible establishment of precedent.

Factual data for solving current problems generally take one or more of these forms: Estimated traffic usage; traffic volume by types; data on turning movements; study of accident records; study of driver behavior, and origin-destination surveys. For long range planning, the data are concerned with road inventories; priority ratings; research, and estimates of revenue.

Gathering of Data a Continuing Operation

Particularly valuable to the highway administrator are the factual data gathered in a survey of the use of roads of each highway system within a state. Since this material must be readily at hand and constantly up-to-date, the gathering of data on traffic volume, accidents and the like must be a continuing operation.

In this modern day of high speed and congested highways, certainly maximum safety and service cannot be provided without this information. Handling such routine problems as the establishment of traffic lights and speed zones depends almost entirely on data concerning traffic volumes, directional movements, driver behavior and the like.

So closely has traffic engineering become associated with highway administration during the last decade, that the uses of traffic data are

now almost basic. Even at the risk of stating facts that are too elementary, it might be well to review some of the important purposes these data serve in the day-by-day administration of a highway system.

Data for Design

In designing road facilities, the availability of traffic data is essential. The location and design engineer must carefully consider traffic volume, type, speed, directional movement and pedestrian counts. In many cases, origin and destination facts are essential in preparing construction plans for new location, by-pass, and similar facilities.

In determining roadway widths, it is important to have not only the present-day traffic counts but an estimate of the traffic count after the improvement has been made.

In the design of bridges, traffic is a factor not only as to volume but as to type. The bridge engineer must know volume to determine the number of lanes; he must have some idea as to the type of traffic to determine the loading and lane widths.

Traffic data are necessary for proper handling of a project under construction. How much traffic will move over the project? Where is it going? With these answers, it is possible to provide proper facilities and designing during the course of a construction project.

Traffic counts and information regarding truck weights are of utmost importance in highway maintenance. In many instances the reasons for pavement deterioration may be found simply by checking traffic, particularly truck volume and truck weights. Maintenance plans and procedures are closely related to traffic.

Equitable distribution of highway funds and budgeting of funds to specific projects depend to a large degree on traffic data. And traffic information is essential for justifying to the public the need for proposed facilities.

Highway planning in itself is nothing new. It is as old as highways themselves. But the organized state-wide highway planning survey is a relatively new development made necessary by the tremendous growth of motor vehicle usage.

Virginia's Planning Survey

Virginia's highway planning survey was established in 1936. At that time all highway safety work was handled by a safety engineer who was responsible also for employee safety, damage claims and related matter. The safety engineer was quick to recognize the value of traffic data that the planning survey was gathering, and put to practical use the information of value to him.

The first data he requested were traffic counts at certain intersections in connection with justifying traffic signal controls. That was fifteen years ago—and probably marked Virginia's first use of survey data in connection with highway safety.

Other early uses included straight traffic counts; the use of traffic flow maps by State Police in the assignment of personnel to patrol the highways; the joint use by highway engineers and State Police of traffic flow data to determine accident frequency, and the use by maintenance forces of traffic data in deciding upon locations for pavement marking.

Despite these early advantages, it was only in 1940 when national preparation for war became the order of the day that the true usefulness of a planning survey became apparent. The access road program and other highway and transportation problems created by war required several different kinds of studies.

One factor was common to all—the need for speed. Traffic studies, estimates and reports pertaining to location and design of access roads had to be made in a matter of days rather than months.

The satisfaction of accomplishment breathed new life into Virginia's planning survey and from that time on the organization ceased to be simply a gatherer of statistical data. It gradually assumed a position of responsibility and respect within the department. Under the able leadership of Burton Marye, Jr., it became an essential tool in the hands of highway administration. Mr. Marye is now Assistant Chief Engineer of the department.

In 1943 Virginia's planning survey was reorganized and became the Division of Traffic and Planning. Its head was named to the Highway Commissioner's staff and given a status comparable to the division heads of the department.

A 20–Year Plan for Highway Development

During the latter years of World War II, the Division of Traffic and Planning completed the most far-reaching and important highway planning study ever made in Virginia. The State's General Assembly in 1944 directed that a comprehensive study be made of Virginia's highway needs. Submitted to the Governor in 1945 and submitted by the General Assembly in 1946, this was Virginia's 20-year plan for highway development—currently the basis for all road construction in the state.

Going into operation immediately at the end of the war, the plan projected highway needs twenty years into the future and outlined the basic essentials on which an adequate road system might be secured.

Research that went into the plan's preparation included a detailed inventory of the state's entire primary system. Standards were developed for each route, based on current and anticipated traffic. Existing deficiencies were spot-lighted and an orderly program for correcting the deficiencies was outlined. To develop such a program, it was necessary to determine anticipated revenues and a great mass of supplementary data.

As a result of this one project, Virginia's highway administration knows in what direction it is headed. And it has the facts to back up its contention that this direction is the right one.

One Highway System, One Highway Problem

Since 1932, the Virginia Highway Department has been responsible for all public roads, primary and secondary, in ninety-seven of our one hundred counties. Our department has been working for years to obtain a smoothly working team for state-wide highway development. This team is composed of city, county and town officials and community leaders, the State Highway Commission, its engineers and employees, and those interested in giving the best highway service to all the people, all the time.

Our studies and efforts have led us to the conclusion that we have but one highway system and one highway problem—an over-all problem.

We have the arteries of the primary system.

We have the city and town counterparts of these arteries.

We have our veins—the farm-to-market, home-to-work, home-to-school roads.

We have the city and town connecting streets and avenues that serve the same purposes as their country cousins. We have the capillaries which serve only a few farms or rural dwellings. We have the new sub-division street just within or just without the corporate limits. It serves a limited number.

From the capillary of a few vehicles a week to the great arteries of 50,000 vehicles each twenty-four hours our highway system is *one* system. Just as an area as large as Virginia—40,000 square miles—could easily lie in the drainage basin of one great river, so our more than 50,000 miles of rural roads and town and city streets comprise but one system, one net-work. As a river drainage basin pays little attention to man-made political sub-divisions as counties, cities, towns and the like, so our great highway system does not stop at county lines or corporate limits.

The private motorist and commercial vehicle, no matter what their origin, route or destination may be, are all looking for the best highways and streets that can be afforded.

We believe that we can show that (1) we have but one highway system, (2) that we desire that system to be as healthy, vigorous and prosperous as is practical.

Our federal government recognizes the one-ness of the highway problem. The same roads that are most used for business and pleasure are the principal arteries of national defense. Since World War II, there has been Federal Aid for all three classes of highways: (a) for the primary system, (b) for the urban system, and (c) for the secondary system.

The Urban Problem

During postwar years, Virginia cities like those throughout the nation have suffered increasingly from traffic congestion and parking shortages. In recognition of the fact that rural and urban traffic problems could not be separated by a corporate line, the highway department has established an urban section in its Traffic and Plan-

ning Division. Its purpose is to aid the cities with their many complex traffic problems.

Public Relations

One of the major concerns of the highway administration today is public relations. The great bulk of the public is entirely unaware of the serious problems confronting the highway departments. The average motorist may realize that one or more routes in the state are not quite as good as he would like them to be—but he has no concept of the scope of the overall road obsolescence nor the cost involved in correcting the deficiencies.

Traffic data provides information that can be invaluable to the highway administrator in bringing before the public complex road problems of the day. Too, legislators are deeply interested in the facts brought to light by traffic surveys.

Assembling Data Takes Time

The highway administrator can be of great assistance to those charged with obtaining the traffic data so important to him. By realizing the deliberative character of much of their work, he can do much to ease the pressure on traffic engineers. It seems that all highway departments are always short-handed. There is never sufficient personnel to do all that should be done. Consequently, the administrator finds himself harassed with daily problems of immediacy—decisions on problems which perhaps should have been made yesterday, last week or even last year. The longer they are put off, the more urgent such decisions become.

When the traffic or planning group is called on for assistance, it will likely require considerable time for research, survey or investigation. By the time this has been completed, it may be that the deliberative answer which results may be useless—useless because the urgency of the problem has already required the administrator through sheer necessity to make a decision.

Situations of this sort can be avoided by giving those charged with gathering traffic data as much advance notice as possible. Traffic data cannot be gathered overnight.

Reports Must Be Clear and Brief

The administrator also should insist on brief, clear reports. Much information of value has been lost to the administrator because of the mass of data assembled in voluminous reports and bewildering tabulations. The administrator finds the perusal of lengthy technical reports as unpleasant a task as does the layman. A clear and concise presentation of the salient facts will suffice for the administrator's use and for the use of legislative bodies, civic groups, newspapers and other interested persons.

The administrator should make it his responsibility to see that his traffic department fully understands his needs. The traffic engineer should be spared the task of drafting voluminous reports filled with needless data.

One of the most serious detriments to the traffic and planning surveys has been their relegation to subordinate departmental level and the absence of intimate liaison with the administrator. This situation was corrected in Virginia in 1943 when the planning survey was raised to divisional status.

Major Uses for Traffic Data

In summary, it might be well to recap the major uses that can be made of traffic data and related planning surveys. Certainly the following should be included on any such listing:

1. Traffic volumes and types should govern the classification of a state's highway system—and the classification should govern design, speed, maximum curvature, minimum sight distance, number of lanes, lane widths, etc. These geometric standards are directly related to traffic safety and traffic capacity.

2. Directional volume counts, by type of vehicle, should be used to determine intersectional design.

3. Directional volume counts, vehicular and pedestrian, supplemented by examination of accident records, should be used to determine the justification, if any, for signal control at intersections.

4. Cultural development, supplemented by volume counts, speed determination, and accident records, should be considered in the establishment or elimination of restricted speed zones.

5. Data on degree of curvature and superelevation should be used in the marking of the safe speed on curves.

6. Data on vehicle miles of travel, supplemented by accident records, should be used in the determination of "high accident frequency" stretches of highway.

7. Data on vehicle and pedestrian volumes should be used to determine need for sidewalks.

8. Grade crossing survey data should be used to establish priority in formulating grade crossing elimination or protection programs.

9. Bridge inventory data should be used to govern the erection of all clearance signs and markings.

10. Inventory data should be used in connection with the routing and issuance of special trip permits for overweight and oversize vehicles.

11. Volume data should be used in establishing priority of construction and reconstruction of state highways.

12. Accident data should be used in designing special treatment for accident prone locations.

13. Origin-destination data should be used to determine relocations, justification for cut-offs, by-passes and the like.

While this list embraces the more important usages of traffic data as related to providing maximum service and safety for present-day traffic, it is by no means all-inclusive of the full potential of such data in the much broader field of traffic facilitation.

A Major Study

One of the recent studies requested of our Traffic and Planning Division was the determination of the routes and mileage that should form the primary system.

In the last thirty years the mileage of the primary system has more than doubled. Some additions have been fully justified, others resulted from a desire to relieve the counties of some of their burden. This came before 1932 in which year the Highway Department was given the roads in ninety-seven of our one hundred counties. Based on the traffic data developed we believe that the State Highway Com-

mission will know the mileage that should properly constitute the state primary system. Some day we hope to have substantially the primary system that we should have.

A Broad Concept of a Traffic Division

Many traffic engineering divisions have been considered as organizations established to deal solely with the day-to-day problems of highway operation and traffic control. The broader concept should assign equal importance to working toward a highway network which will be free of current deficiencies and adequate for the anticipated traffic of future years.

Considerable traffic data are necessary to assist administration in planning its future facilities. Any efficient highway administration must anticipate and plan for contingencies which may not arise for years. In this long range planning, every available fact is a necessity and an efficient traffic engineering section to serve the top management is an essential.

Certainly, instances of overdesign of facilities are not abundant in the history of our highway development. For every such instance, there are hundreds of cases of underdesign. The latter have resulted from a lack of facts or knowledge of trends of moving traffic.

It follows that a strong traffic engineering arm—properly organized to anticipate future needs and capable of evaluating their effects—is vital to the highway administrator who is determined to avoid perpetuating existing deficiencies and the creation of new hazards and bottlenecks.

Detroit's Effectively Tough Policy: "Drunk Drivers Go to Jail"

DONALD SLUTZ

Mr. Slutz has been Managing Director of the Traffic Safety Association of Detroit since 1941. Prior to that he had been City Comptroller—and for sixteen years in newspaper work. As City Hall reporter for the Detroit News, he studied governmental operations in cities and wrote articles to improve municipal administration. He gave considerable attention during this time to stressing the need for better traffic-accident prevention methods. The Traffic Safety Association, created by leaders in the automobile manufacturing business in Detroit and now supported by more than sixty business and industrial concerns, is a private, non-profit organization dedicated to a single purpose: the prevention of traffic accidents in the Detroit area. During World War II, Mr. Slutz served as co-ordinator of the Detroit Office of War Transportation. He also has served as chairman of the Public Education Committee of the National Safety Council.

ONE evening a New York City newspaperman, in Michigan on assignment, walked into a Detroit saloon. His eyes chanced on a large poster above rows of whiskey bottles. In white letters against a red background, this poster warned: "DRUNK DRIVERS GO TO JAIL."

Ordering a drink, the New Yorker gestured toward the poster and asked: "Is that the proprietor's idea of Detroit hospitality?"

"Not exactly," the bartender laughed, "You must be from out of town if you ain't seen that poster before. They put up thousands every December, on billboards and in bars. Cops bring 'em around."

"Oh, I get it," the newspaperman said quickly. "The cops *make* you put 'em up. Is that it?"

"No that ain't right, either. The cops ask us to paste them up, but we're glad to get 'em. Fact is, last year one of our posters was accidentally torn, so the boss had me get a new one. You see it's a good argument when a gent has already had enough to drink but insists on 'one for the road'. We explain to him, or rather to his friends, that we can't afford to get into trouble with drunks and especially with drunk

FIGURE 1. A blunt reminder for drivers who order that "last one for the road." Six thousand posters were used in saloons during the campaign last December.

FIGURE 2. Some drivers who fail to heed the warning. Each year they are becoming fewer.

FIGURE 3. Detroit's Traffic Court has an antidote—a jail sentence without alternative of fine. More than 700 drunken drivers were sent to jail in 1950.

FIGURE 4. The end of the road for a drunken driver. Sentences handed down by Detroit's two Traffic Court judges for drunken driving range from ten to 90 days.

drivers. But then we don't have to say much. The newspapers and radio stations keep hitting this 'drunk-drivers-go-to-jail' business until hell won't have it."

"Scare stuff, eh?" the New Yorker asked.

"It's the Gospel truth, mister. In Detroit, drunk drivers *do* go to jail."

To substantiate his statement, the barkeep could have shown him in Detroit Traffic Court records that more than 700 persons convicted of driving while "under the influence" last year were given straight jail sentences without the option of paying fines. Sentences ranged from ten to ninety days. In addition, the driver's license of every person so convicted was suspended, under State law, for a period of three months. Among those 700 at the Detroit House of Correction last year for this offense were persons from all walks of life, including several individuals boasting social prominence or political prestige. One of the group, for example, was a County Court clerk who also was business agent for a potent labor union.

Traffic and December's Flowing Bowl

Sending drunken drivers to jail is by no means a new policy of Detroit's Traffic Court judges. It has prevailed for more than a decade although for many years it was pretty much restricted to the month of December when drinking reaches its peak. Judges took the view that drunken driving constituted a more serious offense during the Christmas holiday season than during other periods of the year for several reasons.

December in Detroit, as in most large cities, is the month that usually records the greatest number of traffic accidents because of seasonal and weather conditions: Long nights, poor visibility, slippery streets and the traffic congestion of Christmas shopping and holiday festivities. Added to these factors during the latter part of December is the hazard created by untold flowing-bowl parties in offices and homes.

The problem child of these holiday celebrations is the normally abstemious person who knows he doesn't handle his liquor well but is persuaded to take two or three drinks on the plea that "Christmas

comes but once a year". Such an individual, of course, becomes a special threat to life and property when he subsequently gets behind the wheel of his car.

The Detroit program is no mere punitive policy to uphold the majesty of the law. Traffic Court judges, the police and the many agencies that support firm dealing with flagrant traffic-law violators look upon this policy strictly as preventive medicine. The sole purpose in sending violators to jail is to take these drivers off the streets before they bring death or injury to themselves or others, and to implant in defendants and all other citizens using Detroit streets a healthy respect for traffic laws. Reckless drivers and persons convicted of speeding at excessively high rates also receive straight jail sentences in Detroit, especially in cases where the defendants have bad driving records.

Such a policy obviously would be ineffective if it were not coupled with alert and vigorous police work. Since 1938, when the Traffic Division of the International Association of Chiefs of Police reorganized the Detroit Police Department in order to bring about a vast improvement in traffic law enforcement based on intelligent accident investigation, reporting and analysis, Detroit has consistently been rated one of the top cities in the country in terms of high-level, selective traffic law enforcement. The ultimate objective of "selective" enforcement is to concentrate on the most serious violations until the casualty accidents caused by such violations are reduced to negligible proportions. By virtue of the Traffic Court's sustained policy, excellent police work and a hard-hitting educational program, the goal of selective enforcement has been reached in Detroit so far as drunken driving is concerned.

The Educational Phase

The educational phase of this program has been directed by the Traffic Safety Association of Detroit since its establishment as a privately-financed, non-profit corporation nearly ten years ago. After experimenting with various appeals the first two years, the Association selected the blunt warning, "Drunk Drivers Go To Jail", as the central theme for its perennial December campaign, and its ad-

herence to this single idea over an eight-year period has made the phrase a by-word in Detroit bars, offices, plants, homes and clubs.

The Association works closely with all governmental agencies engaged in traffic accident prevention activities – the courts, the police, the traffic and street lighting engineers, the schools, legislative bodies and motor vehicle administrators—stimulating and supporting all sound traffic safety programs undertaken by these official groups. Like the Police Department's selective enforcement policy, the Association's continuing educational program is conducted on a selective basis, being directed at major accident problems as they develop during the year.

Using a rifle instead of a shotgun, the Association levels its attack on winter driving hazards during January and February, on the child accident problem when the first bright days of spring lure pent-up youngsters into the out-of-doors, on speeding motorists during the early days of summer, and so on around the calendar.

Every December the Association's educational barrage against the drunken driving menace takes on blitzkrieg proportions. This is made possible by all-out co-operation on the part of newspapers, radio stations, motion picture theaters and other private organizations. In addition to preparing vivid posters for erection on 1,300 street-side standards and more than 6,000 smaller posters for display in bars, taverns and establishments where packaged liquor is sold – all carrying the blunt reminder, "Drunk Drivers Go To Jail"– the Association prepares numerous press and radio releases and newsreel trailers on the drunk driving problem for use in all motion picture theaters in the Detroit area.

In addition to broadcasting spot announcements of various lengths and appeals, the radio and television stations move into high gear during the critical hours immediately preceding Christmas and New Year's Day by using station-break announcements around the clock. Newspaper photographs of automobile crashes and of drunken drivers being escorted to the hoosegow, picture spreads in local magazines, widely-publicized statements by police and court officials, bulletin board announcements in offices and factories, and circulars warning against the accident potential implicit in pre-Christmas parties add to the tempo and weight of the assault.

As a result:

"No one in Detroit who can read or hear," one of the Traffic Court judges said from the bench recently, "can escape the fact that we send drunken drivers to jail."

That this policy has produced large dividends during the last decade is revealed by the records of the Accident Prevention Bureau of the Detroit Police Department. These records show a steady downward trend in casualty accidents caused by drunken drivers since 1941 despite a sharp rise in accident exposure during the last five years, as indicated by the following tabulation:

CASUALTY ACCIDENTS CAUSED BY DRUNKEN DRIVERS IN DETROIT COMPARED WITH ACCIDENT EXPOSURE

Year	*Accident Exposure (As measured by the traffic volume index*)*	*Fatal Accidents Caused by Drunken Drivers*	*Injury Accidents Caused by Drunken Drivers*
1941	100	47	1,774
1942	103	35	1,622
1943	82	12	398
1944	78	8	408
1945	80	10	395
1946	104	7	226
1947	110	6	145
1948	117	3	120
1949	124	4	117
1950	133	2	115

* 100 equals average weekday's traffic volume (motor vehicle travel) in Detroit in 1941. The volume indices are based on continuing traffic counts taken at 24 key locations throughout the city by the Traffic Engineering Bureau.

During the last ten years both fatal and personal injury accidents attributable to drunken drivers have been reduced more than 95 per cent *despite a 33 per cent increase in accident exposure.* As the figures clearly indicate, the intoxicated driver, while a very real menace a decade and more ago, gradually has been eliminated from Detroit's list of major accident factors. The reason why the Traffic Court, the Police Department and the Traffic Safety Association continue to bear down on the tipsy driver year after year is two-fold: First, unlike some traffic violations, drunken driving admittedly is an inexcusable offense under any and all circumstances and an open affront to all law-abiding citizens entirely apart from the hazards

it creates; second, to soften the attack over an extended period of time might well permit this problem once again to get out of hand.

No Temperance Campaign

In no sense has any attempt been made during the ten-year program to bring about a curtailment in drinking *per se*; in fact, all agencies involved in the program have gone out of their way to explain they have no desire whatever to reduce alcoholic consumption or to interfere with festive occasions at any time of the year. All promotional materials and official pronouncements total up to one clear-cut admonition: Don't drive if you've had that one drink you can't handle. As a result, holiday party hosts, saloon-keepers and citizens generally have been making an increasing effort to call a cab for a listing comrade or to make sure he gets home in the car of a sober driver. It is pertinent to note that the Michigan Table Top Licensees Congress, an organization of bar owners, and the Michigan Beer and Wine Wholesalers lend their full support to the educational program against drunken driving, and that two of Detroit's leading breweries are supporting members of the Traffic Safety Association.

Why 700 Last Year?

The reader may well ask: How does it happen, in view of Detroit's successful program against drunken driving, that more than 700 persons were jailed for this offense last year? One answer is that more than a million persons drove motor vehicles on Detroit streets during 1950, including non-residents of whom many doubtless were unaware of Detroit's traffic safety program and Traffic Court policies. (Year after year non-resident drivers are involved in 24 per cent of fatal accidents and 19 per cent of injury accidents on Detroit streets, while a large percentage of those arrested for moving traffic violations are found to be non-residents or persons newly arrived from various sections of the country.) Thus, appreciably less than one-tenth of one per cent of the motorists using Detroit streets were jailed for drunken driving during the past year.

The other answer, as previously noted, is found in alert police work. Detroit police officers are on the lookout at all times for persons

suspected of driving while under the influence of intoxicating liquor, and police technicians are trained to use chemical tests in determining scientifically if alcohol has definitely impaired a person's ability to operate a motor vehicle. Chemical tests have proved to be an invaluable aid to the police in Detroit, as in other cities where such tests have become routine police work, in establishing innocence as well as guilt.

Detroit's Traffic Court policy was expanded and strengthened last May, following a sharp increase in accidents caused by speeding and reckless drivers. This new policy, decreeing straight jail sentences for flagrant violators, was promulgated not only to discourage an unmistakable trend toward faster and more reckless driving, but also to serve as a forcible reminder to persons driving on Detroit streets that they must discipline themselves to safe and sensible behind-the-wheel behavior regardless of how irksome this idea may seem to be, particularly to youthful drivers.

And there are special reasons why young Detroit drivers are hard to convince. Unlike many an older and quieter community, Detroit is a high-spirited, hurry-and-hustle kind of town, full of competitive zeal. Most Detroiters want to get places fast. But trying to get places fast is a rather frustrating experience in a city that has no highways designed to meet the needs of the modern motor vehicle, a city that of necessity is heavily sprinkled with traffic signals, stop signs, railroad grade crossing warning devices, flasher lights and innumerable signs that read NO LEFT TURN, NO U–TURN, NO TURN.

With the steady increase in automobile travel since the end of the last World War, traffic congestion has become a vexing problem in Detroit, and traffic authorities long have realized that congestion is an indirect cause of serious accidents. Only the well-disciplined driver can resist the temptation to speed when he reaches a clear stretch of roadway after a tedious experience in heavy and slow-moving traffic. Nor will these problems be lessened until Detroit is physically equipped to meet the needs of the automobile era. (The lack of modern highways in Detroit is not attributable to any short-sightedness on the part of municipal officials. The City simply could not afford to contribute even its proportionate share toward the building of such highways until recent years for the reason that Detroit's rapid growth in area and population taxed the City's resources in

meeting minimum municipal needs. Detroit traffic engineers have done a good job in making the best use of existing streets. And two great expressways now are being built and the present City administration has pushed through necessary legislation to greatly accelerate their construction.)

Joint Announcement of the Policy

Detroit's two traffic judges, Judge George T. Murphy and Judge John D. Watts, were mindful of all these factors when they decided to deal more firmly with flagrant violators. Their new policy became operative May 8, 1950, and was announced in a joint statement reading as follows:

"In the first four months this year, Detroit was the scene of 18,211 motor vehicle accidents, an increase nearly 30 per cent greater than during the same period in 1949.

"Sixty-nine persons were killed in these accidents, a ten per cent increase in fatalities, and nearly 4,500 persons were injured.

"Motor vehicle travel in Detroit is mounting sharply, but greater accident exposure does not necessarily mean more accidents. Detroit has repeatedly demonstrated that accidents can be reduced despite increased travel and volume. It can and must be done again.

"We are convinced that most drivers are law-abiding citizens who honestly attempt to observe the traffic laws. We urge their continued co-operation in this effort to save lives and avert injuries.

"Yet we have noticed on the part of some of our drivers a marked increase in fast driving and an attitude that shows a flagrant disrespect for the law. We believe these are the factors which make the present situation so critical.

"Last year's record shows also that reckless driving and speeding exacted a frightful toll of dead and injured. Fifty-seven persons were killed and more than 2,600 injured in Detroit motor vehicle accidents because of these two violations.

"It is apparent that many Detroiters do not understand what obtaining a driver's license means. They fail to realize that they are being granted a privilege to drive, a privilege that can be taken away by the State or this Court, if it is abused.

"Because we believe that a traffic law violator, who is given a

jail sentence and who is denied the use of his automobile for an extended period of time, will become a more law-observing driver, this Court is now putting into effect a continuing policy to penalize willful, thoughtless and careless violators.

"Effective immediately, it will be the policy of this Court to impose straight jail sentences and to suspend drivers' licenses for a *minimum of 60 days* in those cases where:

1. Motorists are convicted of reckless driving under the State law, where speeding or drinking is a factor, and

2. Speeders are found guilty of driving 15 miles or more above the established speed limit in business and residential areas, and

3. Persons are convicted of driving under the influence of intoxicating beverages. (Such drivers automatically lose their licenses for 90 days under State law.)

"The Detroit Police Department, in support of this new policy, has announced that it will intensify its traffic law enforcement efforts, with particular emphasis on the apprehension of week-end violators.

"The Traffic Safety Association of Detroit and the Automobile Club of Michigan, in support of this policy, are preparing a broad educational program to alert the public to its provisions and to bring about a greater degree of traffic law observance.

"Because more than 90 per cent of all Detroit motor vehicle accidents are caused by traffic law violations, the obvious solution of our traffic accident problem is *better traffic law observance.*

"Many Detroit motorists voluntarily observe traffic laws. The police and this Court will deal with those who don't."

Newspapers and radio stations gave the new policy the widest attention for three days before it went into effect. On the first Monday under the new policy, 18 week-end violators went to jail for periods ranging from five to ninety days. From May 8 through the month of December, more than 2,400 persons had been jailed — an average of more than 300 a month. Sentences averaged slightly in excess of eleven days each.

Detroit's new "get tough policy", as newspapers described it, received nation-wide publicity and instantly produced widely-varied reactions throughout the country. Virtually all newspaper comment was favorable but, oddly enough, traffic authorities in some states

viewed the idea with apprehension. The concensus of the latter group in effect was: "The policy won't last. The public won't stand for it and the judges will have to retreat from their position, with the result that the whole traffic safety program will be set back in Detroit and elsewhere."

If there are any vigorous dissenters in Detroit, they have not been vocal to date. Even the violators serving jail terms for the most part agreed that "they had it coming", according to Detroit newspapermen who interviewed a goodly number of them at the Detroit House of Correction. The typical violator, these interviews revealed, is willing enough to take his medicine so long as others convicted of similar offenses receive the same dose. This view probably reflects the attitude of the typical American motorist: He doesn't complain too vigorously against being punished for a traffic law violation if he knows he is not being discriminated against.

Promotion and Reaction

Since the new policy became operative, Judge Watts has responded to invitations to explain the Detroit program in talks before traffic groups in New York City, Milwaukee, Cleveland and Atlanta. How the policy operates is dramatically told every Thursday night in a fifteen-minute television program broadcast by a Detroit station, WWJ-TV. This program consists of a re-enactment of actual Traffic Court cases, the participants each week including the judge, court employees and the police officers who officially were involved in each case. Professional actors play the roles of defendants, whose names are not used, but all testimony closely follows the official court records. This program has a large following for the reason that it has proved to be "good theater" as well as effective education.

How one Detroit newspaper views the policy of the traffic judges is clearly stated in the following editorial which appeared in the Detroit Times under the caption, "Jail Is The Convincer", shortly after the new policy went into effect:

> "Detroit traffic judges insist they will continue sending reckless and drunken motorists to jail despite vigorous pressure that they ease off jail sentences.

"We are glad they ignore the pressure. We hope they make it a permanent policy of Traffic Court to impose straight jail sentences for drunken or reckless driving, without the option of a fine.

"We are confident, if they do make it a permanent policy, the number of drunk and reckless drivers on Detroit streets will be reduced so substantially within a year as to make jail sentences a rare necessity.

"We are not stiff-necked Puritans on this newspaper. We do not subscribe to the reactionary belief that harsh justice is the only good justice.

"We are convinced, however, that the only practical way to curb reckless driving is to send the perpetrators to jail. We are convinced their sense of responsibility is so blunted that token punishment—warnings or fines—does not impress them.

"There is something unhealthily motiveless about reckless driving. What does it profit a man to drive at break-neck speed on city streets or to drive when he has had too much to drink?

"He knows—every teen-age boy or girl knows—that reckless driving invites disaster and beckons death.

"And what is the percentage for the motorist who takes these chances?

"None.

"If he reaches his destination without mishap, he would have done the same driving safely.

"Pressure upon the court for lighter punishment has been exerted by parents of irresponsible youngsters sent to jail and by politicians and influential friends of jailed motorists.

"Such pleaders are short sighted. Certainly it is humiliating for the mother and father of a boy who must serve 10 or 15 days for reckless driving.

"But if, in the face of repeated parental warning and all the educational warnings of the recent past, a boy is convicted of reckless driving, he must be pretty close to incorrigible. Jail might jolt a little sense into him.

"Detroit motorists definitely have improved their driving manners since the straight jail policy started. Drivers are more careful.

"It's too bad if cowardly fear is the only thing that makes them mend their ways. But apparently jail is the only convincer."

And "The Commentator", a widely-read columnist of The Detroit News, had the following to say:

"Only a slight amount of sympathy can be given speeders and drunk drivers who have been sentenced to the House of Correction. That minimum is occasioned by the fact that they are the first victims of a harsher policy, which may be abandoned at any time at the discretion of the Traffic Court. The victims may feel that the Court is making examples of them, for public effect; and that when the effect has been produced, the Court will return to its former comparative lenience.

"The commentator believes that the Traffic Court's present policy is the correct policy in perpetuity, and that it should never be relaxed. Excessive speed and drunk driving are criminal dangers to life and property, as the police truly point out. Therefore, they should be dealt with as such; they should be made dangerous for those who practice them. Sentences to the Hoco for the few are likely to act as a preventive on the many. Even if the lusher has lost his sense of responsibility, it may be that he has friends who will keep him from taking a chance."

Analyzing Results

Within recent months some critics have expressed the view that the Traffic Court's firm policy, while sound enough in principle, has not obtained conclusive results in cutting fatal and injury accidents. This appears to be a valid observation so far as 1950 is concerned because the new policy did not bring about a spectacular decrease in casualty accidents. Agencies supporting the program point out, however, that Detroit's traffic accident problem would have gotten totally out of hand last year if the judges had not put their firm policy into effect, contending that the new policy leveled off the accident curve which had been zooming upward in the early months of 1950.

This argument obviously involves too many imponderables, but it is clear that Detroit's traffic safety team in 1950 was able to hold the line against the greatest accident potential in Detroit's history (an all-time peak in traffic volume) and certainly the policy of the traffic judges must be given a fat share of the credit.

Another important consideration, in any effort to evaluate a current program, is Detroit's traffic safety record through the last twenty-five years. For twelve consecutive years (1926–1937) more than 300 persons were killed annually in Detroit motor vehicle accidents. During seven of the last eight years the death toll was held below 200. The extent of the improvement made in the last decade is indicated by the following comparison: In 1941, Detroit motor vehicle deaths totaled 277. If fatal accidents had increased since that year in direct proportion to the 33 per cent increase in motor vehicle travel, the 1950 death total would have been 369. The actual number of traffic deaths recorded last year was 197. These figures are cited only to point up the fact that the business of cutting accidents is

considerably more of a task in Detroit today than it was a decade or two ago.

Of profound significance is the fact that Detroit's traffic judges, each of whom may act independently of the other, see eye to eye on the problem of dealing with the flagrant traffic law violator. Judge Murphy is a veteran of fifteen years on the Traffic Court bench, while Judge Watts is in his sixth year. There are marked differences in their backgrounds and personalities. But they agree that a traffic court can best serve a community by building up a solid respect for traffic laws and that this can be done only by imposing uniform and, when necessary, firm penalties upon those whose acts disclose a contempt for these laws. By putting this philosophy into practice, and applying it day after day, ignoring heavy pressure exerted on them from time to time, they have made a magnificent contribution to traffic accident prevention in Detroit.

Adequate Parking in Business Areas

FREDERICK P. CLARK

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FOR SOME years now the parking problem has superseded the weather as a topic of conversation. But in contrast to the old saying about the weather, something is finally being done about parking.

Action has been slow in coming—still is in many places—because of the emphasis on finding an inexpensive and painless method of providing the added parking space everyone agrees is needed.

For a while, there was hope that the parking meter would cut down the stay of a car at the curb and thus make place for all cars needing space. Now it is seen that while meters increase parking turnover and help police enforcement, they do not solve the problem. Only a sufficient increase in parking space will accomplish that.

In approaching the question of obtaining off-street parking areas to supplement curb parking space, most communities seemed to regard money spent for this purpose as money gone. Therefore, little was spent, little done, and that little more often than not on odd bits of vacant land poorly situated for the purpose. As a consequence, such parking lots received relatively little use and "proved" to

opponents of municipal action that only a few would use the off-street parking space when it was provided.

Yet a few communities have experimented along right lines, and their successful results encouraged others to action. However, the average person reading of notable examples of off-street parking progress—San Francisco's underground garage, Washington's garage-office building and New York's huge garage at the Manhattan entrance of the Brooklyn-Battery vehicular tunnel—has the impression that the parking problem is being solved in only a few places and only by spectacular means.

Actually, municipal progress in meeting the parking problem is fairly widespread; more so than even many persons working on the problem have recognized.

In 1949, the writer, in preparing a paper on local parking progress for the annual Regional Plan Conference in New York City, was impressed by the great amount of accomplishment registered by communities in the New Jersey–New York–Connecticut metropolitan region. And so the random survey made for the purpose of the paper was expanded. Eighty-four of the region's 550 municipalities were queried. Of these, sixty-two places had established, had authorized, or had in process municipal off-street parking systems.[1]

The survey disclosed a substantial body of experience with the municipal provision of off-street parking facilities, and that no community need think any longer that it is pioneering when considering municipal action in this field.

There has been for years a rapidly increasing body of technical advice on the best ways and means of handling traffic and parking problems. Much of this has been drawn from local experience. But what a great many communities have needed to help them make up

[1] The Regional Plan Association, Inc., 205 East 42nd Street, New York 18, N. Y., has published the results of this survey in two reports: "Municipal Parking Systems in the New York Metropolitan Region," analyzing the overall results of the survey, showing plans of outstanding systems, giving financial data for each system and citing specific examples of different financing methods. Bulletin No. 76, August 1950—$2; "Municipal Off-Street Parking" a Supplement to Bulletin 76, giving details for each of the sixty-two municipal parking systems, cost data for individual parking fields recently established, and information on parking fees, time limits and local zoning provisions for individual communities. Supplement to Bulletin 76, October 1950—$2.

NOTE: The two publications may be purchased for a combined price of $3.50.

their minds to go ahead with constructive parking programs is a substantial body of information on what other communities have *actually done,* what they have spent, and how they have financed their programs.

In order to indicate the body of this type experience now available, the following paragraphs will summarize a few of the findings of this survey by the Regional Plan Association. The information covers only the sixty-two municipalities studied in the New York Metropolitan Region.

An Accelerating Trend

About 1938, municipal action on off-street parking really got under way in this area. A few communities had made a start about twenty or twenty-five years ago, but these were isolated instances.

However, municipal action was sporadic until after World War II. Since then, municipal action has proceeded at an accelerating rate. Each year since 1945, a substantially greater number of new municipal off-street parking fields have been established than in the previous year. New parking capacity established annually increased from 468 car spaces in 1945 to 4,710 car spaces in 1949. The total for the first three months of 1950 was 4,800 car spaces.

Substantial Municipal Investments

The increasing movement in establishing municipal facilities is reflected in the rising amount of municipal investment for this purpose. While up to 1945 only slightly more than one million dollars had been spent on public parking areas by the fifty-two municipalities reporting financial data, they have invested $7,307,000 additional for parking facilities since that year.

These fifty-two municipalities had an average population of 23,600 and had invested an average of $6.28 per capita on municipal off-street parking.

Nine of the fifty-two places invested substantially more per capita, as follows:

	Per Capita
Bronxville, New York	$66.80
Cedarhurst, Long Island, New York	51.70
Rye, New York	42.70
Great Neck, Plaza, Long Island, New York	42.60
Hempstead Village, Long Island, New York	32.20
Larchmont, New York	30.20
Freeport, Long Island, New York	30.00
New Canaan, Connecticut	28.50
Garden City, Long Island, New York	23.30

Direct Taxpayer Financing Most Used

Municipalities were found to have been using practically all the various methods of financing municipal parking. These included:

1. Direct financing from current budgets
2. Bond issues repaid from general taxation
3. Special assessments on directly benefiting property
4. Parking meter income
5. Public subscription
6. Parking authority

In addition, land has been acquired for parking use without municipal cost through:

1. Gift
2. Lease
3. Use of lands acquired through non-payment of taxes
4. Use of public lands not needed for other public purposes

Direct City Financing

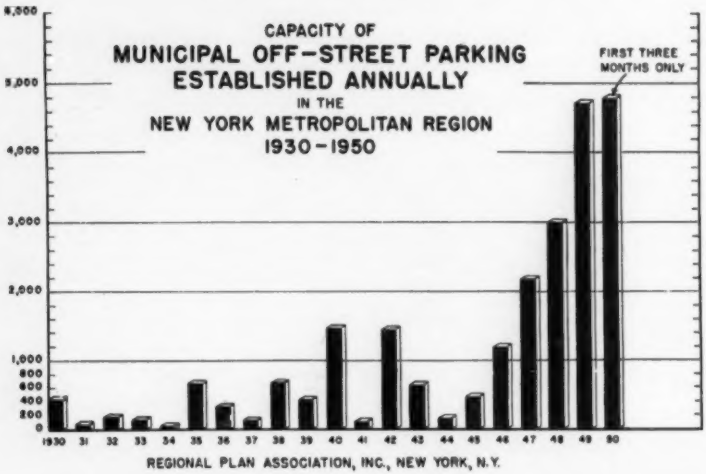
The method used in most communities and apparently having resulted in the greatest success is that of direct financing by the municipality, using bond issues and current budget funds.

Fifty-two per cent of land for municipal parking in the communities surveyed and ninety-three per cent of improvements have been financed by bond issue or current budget: in other words, primarily financed by the taxpayer at large, not the special users. This is evidently in line with a belief that such terminal facilities

Here parking is at rear of stores, White Plains, N.Y.

The use of interior lot parking. Hempstead (Village), N.Y.

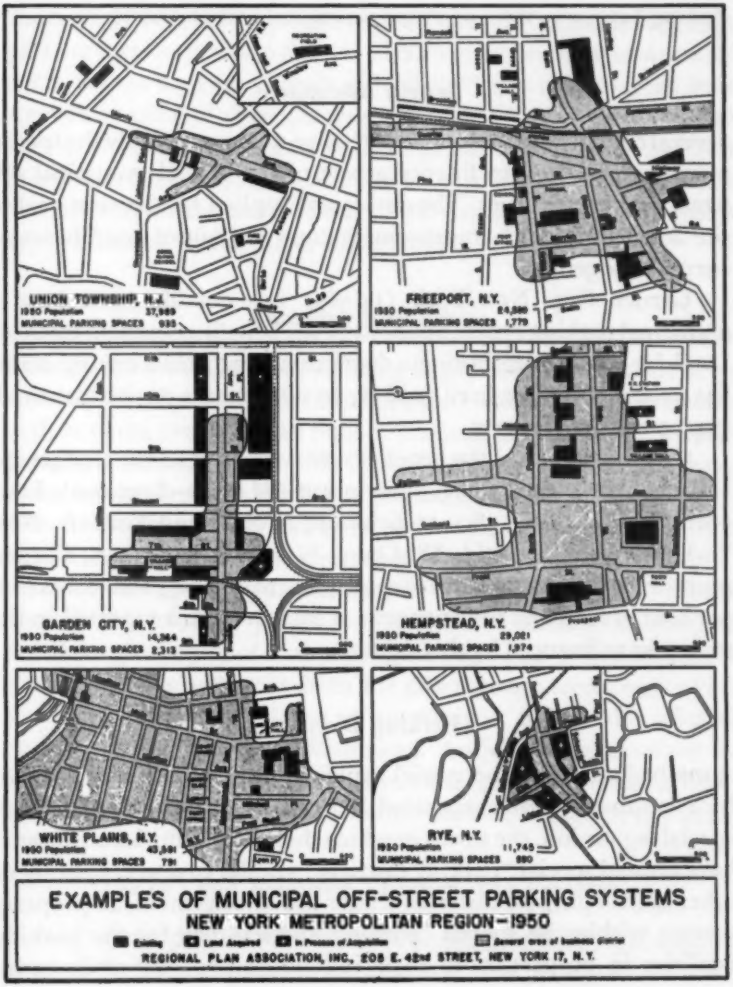
Parking lot entrances to stores, Garden City, N.Y.



should be considered as an integral part of the municipal street system.

Outstanding examples of the use of this method are Bronxville, New York (6,718)[2] which has built two parking fields with a

2 Figures in parentheses are preliminary 1950 population data, given in order to relate program to size of community.



$450,000 bond issue; Rye, New York (11,745) which is now building a system of five parking fields under a $500,000 bond issue, and Cedarhurst, New York (6,021) which has financed three fields with a $312,000 bond issue. Other significant examples are Montclair, New Jersey (43,775) with seven fields built with a total bond issue of $275,000, and New Canaan, Connecticut (7,968) with four fields costing $227,000, most of which was raised by bond issue.

Benefit Assessment

Several communities were found to have used successfully the special assessment method to finance a part of the cost of municipal off-street parking facilities. The device was applied for the most part to site acquisition, with improvement costs met out of bond issues or current budgets.

Garden City, New York (14,363) is a notable example of a municipal parking system financed by the benefit assessment method. Land for its thirteen business district parking fields, costing about $334,000 to date, has been paid for by assessments on the surrounding, benefiting property.

Other examples of the benefit assessment method are Hempstead Village, New York (29,021—nine municipal fields—$935,000); Freeport, New York (24,589—15 fields—$737,000); and Yonkers, New York (152,533—one field—$825,000). With two exceptions, all communities using this assessment method were on Long Island. Sixteen per cent of land and four per cent of improvements reported in the survey were financed by this method.

Parking Districts

A method similar to the special benefit assessment procedure is used by a number of unincorporated Long Island communities. Under special legislation, the towns in which these communities are located have created special "parking districts," similar to sewer, lighting or other special purpose districts. Under this arrangement, all property owners within the special "parking district" pay for the parking facilities in proportion to their individual property assessments.

Seven such districts have been established to date, at Baldwin, Franklin Square, Hicksville, Manhasset, Massapequa, Oyster Bay and Port Washington, all in Nassau County, New York.

Parking Meter Revenue

Some sixty of the metropolitan region's 550 municipalities are using parking meters to ration the use of curb space in their business districts. Except for Port Chester and White Plains in New York State, apparently none of these places specifically allocates meter receipts for the acquisition and development of off-street parking facilities. Montclair, New Jersey, while it does not so allocate meter income, does look upon the annual costs of the parking area bond issues as being balanced by the meter collections.

Parking Authorities

This device for taking the financing of parking facilities out of the municipal budget and debt limit has been tried by only a few municipalities of the metropolitan region. To date, the Passaic, New Jersey parking authority is the only one to arrange for financing based upon its own credit as distinguished from that of the municipality. The Authority recently sold $670,000 in bonds to finance the initial steps in its municipal off-street parking system.

Two other parking authorities, in White Plains, New York and New Brunswick, New Jersey, have established parking facilities, but not through the use of authority financing. The White Plains Authority receives assistance from the city through street meter revenues and interest-free loans to supplement fees at the off-street parking fields. The New Brunswick Authority has received the benefit of an interest-free bond issue through the purchase of bonds by local merchants. The bonds on that basis are backed by city credit.

Use of Land Acquired Through Tax-Foreclosure

Several municipalities were found to be using land they had acquired through foreclosure of tax-liens. Teaneck, New Jersey obtained land

for all four of its fields in that fashion, while Rye, White Plains and Larchmont, New York; Perth Amboy, Springfield and New Brunswick, New Jersey were some of the other places relying in part on this source of land for parking field sites.

Most of the sixty-two communities reported that they charged no fee for the use of the municipal parking facilities. Of the total capacity reported 80.5 per cent were free. Where fees are charged it is usually five cents for one hour or five cents for two hours.

Seventy-two per cent of the total parking capacity reported in the survey was available for use without time limit or had an all-day time limit. In the relatively few communities restricting length of parking time, a three-hour limit was most popular.

Parking Lot Costs Vary Greatly

Extensive data secured in the survey and published by the Regional Plan Association show that land acquired for recent municipal parking fields has ranged from six cents a square foot to $6.20 a square foot ($18 to $2,021 a car space, including access drives and other incidental land uses.)

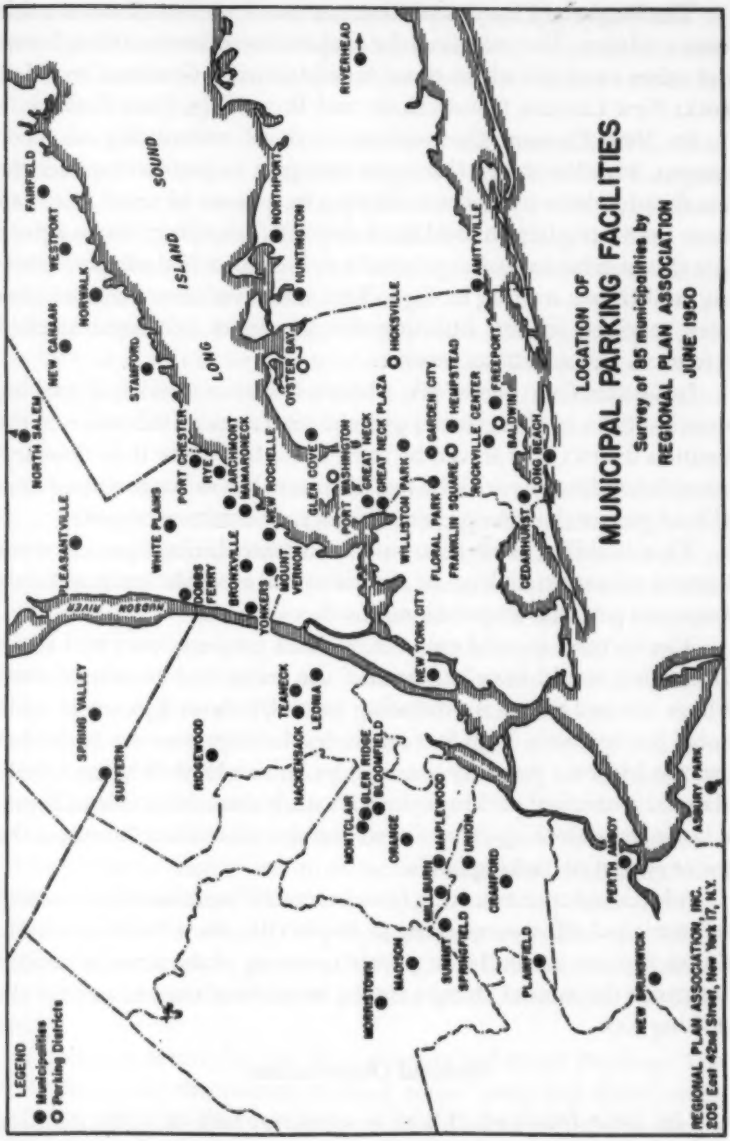
Improvement costs have ranged from practically nothing (simply graded lots) to $1,432 a car space.

AVERAGE DATA—RECENTLY ESTABLISHED MUNICIPAL PARKING FIELDS
NEW YORK METROPOLITAN REGION 1945–1950

Capacity	148 cars
Land Cost	$48,300
Improvement Cost	$28,400
Total Cost	$76,700

Increased Values

Often we hear the argument that the provision of off-street parking space increases business property values or taxes. It has seemed obvious to those who have been working with and urging action on off-street parking. The skeptic, however, has not been convinced, and little or no concrete evidence has supported the claim.


LOCATION OF
MUNICIPAL PARKING FACILITIES
Survey of 85 municipalities by
REGIONAL PLAN ASSOCIATION
JUNE 1950
LEGEND
Municipalities
Parking Districts
REGIONAL PLAN ASSOCIATION, INC.
205 East 42nd Street, New York 17, N.Y.
LONG ISLAND SOUND
HUDSON RIVER
NORTH SALEM
NEW CANAAN
FAIRFIELD
WESTPORT
NORWALK
STAMFORD
PORT CHESTER
RYE
LARCHMONT
MAMARONECK
NEW ROCHELLE
GLEN COVE
PORT WASHINGTON
GREAT NECK
GREAT NECK PLAZA
WILLISTON PARK
NEW YORK CITY
FLORAL PARK
GARDEN CITY
FRANKLIN SQUARE
HEMPSTEAD
ROCKVILLE CENTER
FREEPORT
BALDWIN
LONG BEACH
CEDARHURST
AMITYVILLE
HICKSVILLE
OYSTER BAY
NORTHPORT
HUNTINGTON
RIVERHEAD
LEASANTVILLE
WHITE PLAINS
DOBBS FERRY
HASTINGS
YONKERS
MOUNT VERNON
BRONXVILLE
SPRING VALLEY
SUFFERN
RIDGEWOOD
TEANECK
LEONIA
HACKENSACK
GLEN RIDGE
BLOOMFIELD
MONTCLAIR
ORANGE
MAPLEWOOD
UNION
CRANFORD
SUMMIT
SPRINGFIELD
PLAINFIELD
MADISON
MORRISTOWN
PERTH AMBOY
NEW BRUNSWICK
ASBURY PARK

The Regional Plan Association last year endeavored to assemble some evidence. They received the cooperation of assessors, engineers and other local officials in three municipalities: Garden City, New York; New Canaan, Connecticut; and Bronxville, New York.

In New Canaan, Connecticut, a small community of 8,000 persons, with less than a thirty per cent gain in population over the last decade, there had been a tripling in *volume* of retail sales and more than a tripling in local bank deposits. Local merchants agreed that this gain has been due primarily to the municipal off-street parking established, starting in 1941. This added volume of business has been reflected in new building developments, increased assessed valuation, and added tax income.

In Garden City, New York, where a system of municipal parking areas has been in effect since 1938, the total assessed valuation of the business district area served by these fields had more than doubled, notwithstanding the withdrawal from taxable valuation of an area of land greater than the present total area of business property.

This doubling of business valuation came during a period when assessed valuation of land in the village as a whole increased only seventeen per cent. Population growth was small.

The increase in total value of business property over and above that which would have occurred if the trend had paralleled total village assessed values is producing annually about $40,000 in additional tax revenues. This increase is due in large measure to the fact that the business property is served by an ample, well-located, well-planned municipal parking system. A study shows that this additional tax income since 1938 has already totaled more than the cost of the entire system of parking fields.

Additional taxes resulting from increased business values created by municipal off-street parking in Bronxville, New York amount to almost $60,000 annually, or greatly in excess of the amount needed to finance the annual charges on the bond issue used to pay for the parking lots.

General Observations

1. *The Issue Involved:* There is a general lack of understanding of the basic issue involved in the parking problem as it relates to

business districts. The issue is *not* whether parking space shall be provided. It is whether established business districts are to be maintained, or are to be allowed to decline and new business center development encouraged.

The established business center cannot continue to hold business and compete with new, planned shopping centers unless it is provided with the additional parking space necessary to allow customers to reach it. If this is not done, a community is saying, in effect, that it does not care whether the established center continues to obtain enough customers to maintain its strength.

This might be a wise policy to adopt in a given municipality. It may be that it would be best to abandon the old established center to decay. But a community should clearly recognize that as the issue when it is deciding whether or not to provide the needed parking facilities.

While there is no question that the easiest way to meet the parking problem is by establishing new shopping centers adequately provided with parking space, the effect of this will be a depreciation of property values and a decline of the established business center. This decrease in property values and taxes will not be offset by property values at the new center. The costs of providing public services at the old center will continue and police and fire costs are likely to increase in the depreciated parts of the old business center.

One of the most difficult problems facing cities today is how to reclaim and rehabilitate areas previously allowed to decline. It is a costly and difficult matter.

It seems clear that it is to the advantage of most communities to do everything in their power to maintain established business centers in a healthy condition. This can be done by making them continue to function well in serving the people of the community. One of the big factors is adequate parking facilities. This is the basic issue to keep in mind when deciding on parking for the established business center.

2. *Parking Meter Income Will Finance Off-Street Parking:* The net income from the average parking meter (over and above necessary costs in connection with them) is sufficient to pay for the establishment of one to two average-cost off-street parking spaces.

Estimated Average Income per Meter (Net)[3]

$45–$50

Estimated Annual Cost of Providing One Off-Street Parking Space[4]

$31

This means that an average community with 500 curb meters would be able to finance the establishment of about 750 free off-street parking spaces without added taxes for the purpose. If a charge is made for off-street parking, an even greater amount of such parking facilities could be established.

A recognition of this point by the average citizen interested in being able to park his car should encourage him to insist that his municipal governing body apply the net income from curb parking meters to the creation of adequate off-street parking facilities instead of looking at parking meter income as an added source of revenue for other municipal purposes.

While many municipalities may not be able to legally earmark curb parking meter income for off-street parking purposes, there is nothing that prevents the governing body from allocating an equivalent amount of money in the municipal budget for establishing parking areas.

3. *A Planned System of Parking Is Essential:* The parking problems of a business district are not solved merely by providing an adequate amount of parking space. Many communities have developed their parking fields on a hit-or-miss basis, with the location and size of fields determined by the place a parcel of land happens to be available, and obtainable at a cheap price. Unless the parking space is well located with respect to the destination of the car-user, and unless the off-street parking facilities are well organized with respect to each other and to the business section in the form of a well-planned system, they are not fully effective in serving the business district. A well-

[3] Assuming average net income at 80 per cent of average gross revenue per parking meter in New York Metropolitan Region.

[4] Assuming average cost of $518 a space of recent municipal parking fields in New York Metropolitan Region; principal and interest on twenty-year bond issue at two per cent interest.

planned system will take into account the future needs of the business district, as well as the most pressing requirements of the current situation.

This is obvious to most persons who have attempted to come to grips with the parking problem of business centers, and to some communities that have had unfortunate results from half-way measures. Too many communities, however, are still looking for an easy way to "solve" their parking problems. They are still looking for a way that will not cost much money.

There is no such way; and the sooner communities recognize it, the sooner they will obtain effective results in getting rid of the No. 1 municipal headache. The municipal experience outlined in this article shows that forthright action is now widespread and that there is evidence of substantial economic benefits from providing established business districts with the parking facilities they require.

MUNICIPAL OFF-STREET PARKING FIELDS
New York Metropolitan Region 1950

Place	*1950 Population (Preliminary)*	*Parking Fields*[c] *Number*	*Capacity*	*Cost*[d]
CONNECTICUT				
Fairfield County				
Fairfield	30,474	2	55	$ 5,500
New Canaan	7,968	4	480	227,000
Norwalk	49,507	6	495	72,000
Stamford	73,869	3	245	103,000
Westport	11,432	3[b]	645	[na]
NEW JERSEY				
Bergen County				
Hackensack	29,207	2	689	22,018
Leonia	7,371	1	65	3,900
Ridgewood	17,467	1	160	32,600
Teaneck	32,789	4	346	12,000

Notes: [a] Population estimate by Long Island Association.
[b] Not included in figuring cost of average field, since cost data are not available.
[c] Including those in process of acquisition or development at time of survey.
[d] In cases where incomplete cost data were submitted, estimates by the RPA have been included.
[na] Not available.

Place	1950 Population (Preliminary)	Parking Fields[c] Number	Capacity	Cost[d]
Essex County				
Bloomfield	49,313	1[b]	60	na
Glen Ridge	7,640	1	66	7,000
Maplewood	24,855	7	320	34,000
Milburn	13,712	2	191	58,886
Montclair	43,775	7	750	274,000
Orange	38,404	4[b]	374	na
Middlesex County				
New Brunswick	38,768	5	748	320,500
Perth Amboy	41,291	3	470	40,000
Monmouth County				
Asbury Park	17,035	3	127	9,500
Morris County				
Madison	10,412	2	320	34,198
Morristown	17,078	7	585	99,060
Passaic County				
Passaic	57,846	3	506	670,000
Union County				
Cranford	18,708	3[b]	190	na
Plainfield	42,211	1	236	165,965
Springfield	7,218	1	100	2,500
Summit	17,890	4	448	62,845
Union	37,989	8	935	64,022
NEW YORK				
Nassau County				
Cedarhurst	6,021	3	556	311,600
Floral Park	14,535	4	366	91,600
Freeport	24,589	15	1,779	737,000
Garden City	14,364	13	2,313	334,270
Glen Cove	15,084	3	225	47,000
Great Neck	7,921	3	277	42,000
Great Neck Plaza	4,228	3	360	180,000
Hempstead (Village)	29,021	9	1,974	935,000
Long Beach	15,532	1	333	1,600

Notes: [a] Population estimate by Long Island Association.

[b] Not included in figuring cost of average field, since cost data are not available.

[c] Including those in process of acquisition or development at time of survey.

[d] In cases where incomplete cost data were submitted, estimates by the RPA have been included.

na Not available.

Place	1950 Population (Preliminary)	Parking Fields[c] Number	Capacity	Cost[d]
Rockville Centre	22,276	15	1,580	$31,500
Williston Park	7,469	2	180	33,577
Parking Districts:				
Baldwin	22,000[a]	3	445	96,000
Franklin Square	16,000[a]	2	255	64,803
Hicksville	13,000[a]	1	130	35,000
Oyster Bay	9,500[a]	1	140	37,000
Port Washington	15,000[a]	2	246	180,000
Rockland County				
Spring Valley	4,492	2	640	20,000
Suffern	4,092	1	150	7,400
Suffolk County				
Amityville	6,139	4	455	39,215
Huntington (Town)	46,678	12[b]	682	na
Northport	3,824	3	295	5,000
Riverhead	9,793	2	525	11,000
Westchester County				
Bronxville	6,718	2	202	448,722
Dobbs Ferry	6,246	1	75	1,700
Larchmont	6,293	2	265	190,000
Mamaroneck Village	15,041	3[b]	262	na
Mamaroneck (Town)	24,937	3	na	na
Mount Vernon	71,833	4	215	160,000
New Rochelle	59,626	1	69	50,000
North Salem	1,583	4	100	500
Pleasantville	4,843	1[b]	450	na
Port Chester	23,969	2	260	145,000
Rye	11,745	5	590	500,000
White Plains	43,581	9	791	287,850
Yonkers	152,533	1	380	825,000
TOTALS		230	27,171	$8,469,831

Notes: [a] Population estimate by Long Island Association.

[b] Not included in figuring cost of average field, since cost data are not available.

[c] Including those in process of acquisition or development at time of survey.

[d] In cases where incomplete cost data were submitted, estimates by the RPA have been included.

[na] Not available.

Problem of the Urban Intersection

D. S. BRINKLEY

Mr. Brinkley has been associated with the District of Columbia Department of Highways since 1925. During that period he has been actively engaged in all phases of the Department's engineering activities. He has been Director of the Planning Division since 1946. Mr. Brinkley is a member of the AASHO Operating Committee on Design, the Sub-Committee on Factual Surveys, the Highway Research Board Committee No. 12 on Channelization, and the Association of Highway Officials of the North Atlantic States. He holds an associate membership in the Institute of Traffic Engineers.

SOMEONE once said that the average street intersection is a place where the normally well-adjusted citizen loses his sanity. This rather sweeping comment unfortunately has been echoed by the harassed motorist immobilized in the mechanical morass of countless auto-jammed intersections.

Similar statements have been made by others in the press as pointing up a serious weakness in the partnership between the state which provides the roadway, the manufacturer who produces the vehicle, and the highway user.

The claim is that the deficiency in the transportation "package" lies in the inability of the roadway to keep abreast of improvements and progress achieved by the other two members of the combination. The drain, they say, is not only on the car-owner's fund of wits and patience, but on his purse as well, in the form of the hidden costs of delay and abnormal operating expenses. To mix metaphors, the laggard is charged with holding back the whole class from graduating into the millennium of highway transportation.

Without endorsing this extremist viewpoint, the implied accusation that the highway is the step-child of the highway engineering profession, particularly where it functions as an interchange, has some basis in fact. Even the casual observer is often forced into the conclusion that, despite efforts to find a practical solution, the traffic situation in the majority of American cities continues to rank high on the list of municipal problems.

Although the average layman is not too interested in analyzing the causes of traffic congestion, he cannot avoid noticing the steadily upward trend in standard indices of traffic. Gasoline consumption and new registrations are setting records each year.

Nor can one long ignore the fact that, as matters now stand in this country at least, the already widespread use made of the private automobile for all purposes and the skyrocketing tonnages hauled over the highway by truck will probably increase beyond all expectations. That has been the experience in the past whenever a new cycle of prosperity was generated by preparations for national defense. Inevitably, wartime boom conditions place new classes of wage-earners within financial reach of motorcar ownership, and more and more cars are added to swollen traffic streams.

Traffic Problems of Urban Population

Moreover, the magnetic influence of metropolitan areas as centers of mass employment and as focal points of economic and cultural appeal has been growing stronger. The relatively sudden expansion of urban population groups has also, in many cases, accelerated the breakdown of underdesigned mass transit systems because of serious overloads and delays in service.

This in turn causes a shift to private means of transportation. Undoubtedly, cities are faced with more critical congestion troubles to come and, unless the motoring public voluntarily curtails indiscriminate use of the privately-owned vehicle, the urban street systems will be subjected to even greater stresses. The only alternative is a drastic stepping-up of construction programs and planning activities.

These non-engineering factors have helped to create a situation which, on the whole, is unfavorable to highway departments, because it underscores the deficiencies of the highway product when compared with the fruits of private enterprise. The latter has been somewhat more successful in gearing itself up rapidly to meet the inflated demands of a rising standard of living in a flourishing economy.

Reasons for this maladjustment between the component parts of the highway transportation picture are fairly clear. Unlike the automobile industry with its flexibility, its almost unlimited resourc-

es and its streamlined methods of production, the machinery at the disposal of highway departments cannot well be tooled to turn out and assemble roadway units on a beltline. Much less will it ever be permitted to operate with "sliding-scale" budgets according to changes in the price structure of labor and materials, and in immediate response to needs for new facilities as they occur.

In short, the highway official is obliged to work within legislative, time, and space limitations, in a medium inherited from an age that established the rule that vehicles on public streets must not exceed the speed of the trotting horse. The urban intersection, an integral part of this arrangement, is as surely a casualty of an accelerated way of life brought about by the automobile as was the horse and buggy.

Problems of vehicular circulation that have come up as a direct result of the social and economic forces underlying new demands for highway facilities must be studied in relation to the causes and effects of traffic generators. To arrive at a just assessment of all the varied elements in the urban traffic situation, particularly where the over-burdened urban intersection is concerned, the planning engineer has developed a study method usually referred to as a local origin-and-destination survey. The results of such analyses of travel patterns in particular locations are used in conjunction with other engineering investigations to produce a design that will best serve the movements made by the users of the facility. They are also used as economic justification for new construction.

Channelization an Important Step

By means of this and other design tools, including aerial photographs, panoramic models, etc., to which must be added the levers of imagination and common-sense, a great deal of progress has been made in recent years in working out practical improvements in the performance of troublesome intersections. Channelization is one of the most important of these.

By definition, channelization embraces such engineering devices and geometric roadway layouts as will "separate traffic at grade intersections by the use of pavement markings, raised islands or

other suitable barriers into definite, natural paths of travel which are convenient and attractive to the driver, and which facilitate the safe and orderly movement of both vehicles and pedestrians".[1]

This direct technique aimed at the efficient organization of vehicular movement into and through standard, irregular or multiple intersections is a relatively new concept in the field of highway engineering. As the definition of the term points out, control is accomplished principally by means of strategically placed barriers imbedded in the pavement in the form of islands, median strips, curbs and various other types of separators. Not so long ago, obstacles of any form in the roadway were considered pure hazards. However, over the past ten years or so, during which extensive field tests were made, the traffic engineer gradually reversed his thinking. As a result of this willingness to experiment and depart from tradition, an authoritative fund of knowledge and experience has been accumulated mainly because of a new approach to the problem of the intersection. Its functions were finally understood to be more important than its forms.

Because of the recurrence of certain elements of traffic behavior in this unit of the highway, there has been a tendency to boil down a variety of methods of treatment into a few general formulae and principles intended for universal application. Although it is recognized that standardization insures uniformity of design, which in turn produces standard driver-response and facilitates control, the loss of flexibility due to "yardstick" designing methods outweighs those advantages. Both engineering and traffic requirements are too dependent upon other factors, in themselves unstable, to permit a generalization of the problem.

Of the three basic agents creating intersectional conflicts, the vehicle, the roadway and the driver, the latter is probably the most important and the most changeable and, by extension, so is the vehicle which he controls. Operation characteristics are therefore extremely variable, with the degree of friction, or smoothness, depending on the nature and extent of the deficiencies, or capacities, found in each agent.

In his efforts to control the driver and indirectly manage the

[1] Approved by Highway Research Board Project Committee No. 12, on "Channelization."

vehicle, the highway engineer incorporates certain disciplinary features in his design which not only influence the shape of the roadway, but which also serve to provide more capacity by restricting freedom of movement. At first glance, this seems like a contradiction of terms. Upon closer examination however, the principle that too much freedom leads to erratic movements and dangerous frictions is readily demonstrable as sound. At least, its application has been quite successful in the District of Columbia, where the problem of expediting heavy traffic through complicated intersections is particularly serious.

Washington's Charming but Difficult Design

Washington is a planned city. Its chief designer, Pierre L'Enfant, conceived the idea of superimposing a number of diagonal avenues with 160-foot rights-of-way on a conventional grid pattern. The purpose of this plan was to relate important public edifices, such as the White House and the Capitol, by means of impressive and stately approaches.

While effective from an aesthetic point of view, the design resulted in several huge intersections and circles situated in the heart of the city. These spacious squares and circles lend charm and distinctiveness to the Nation's Capitol, but they also contribute largely to the severity of the local traffic problem. Under peak-hour conditions, the process of merging, weaving and emerging is difficult and hazardous and, at times, impossible.

Fortunately, these unusual intersections and circles, from which as many as ten streets may radiate, constitute a small proportion of the 7,000-odd intersections found in the District of Columbia. About 5 per cent of this total has been channelized on the surface only. The majority of high-volume circles, which lie across the routes to the downtown area, have been improved by the construction of grade separation structures supplemented by surface treatment. This channelization at critical sites has greatly increased accessibility of the business and Government establishments in that area.

In almost every case, the principal form of surface treatment consisted in the reduction of the paved areas at the junction of wide

"Before" Channelization, New York Avenue at 13th and H Streets N.W., Washington, D.C.

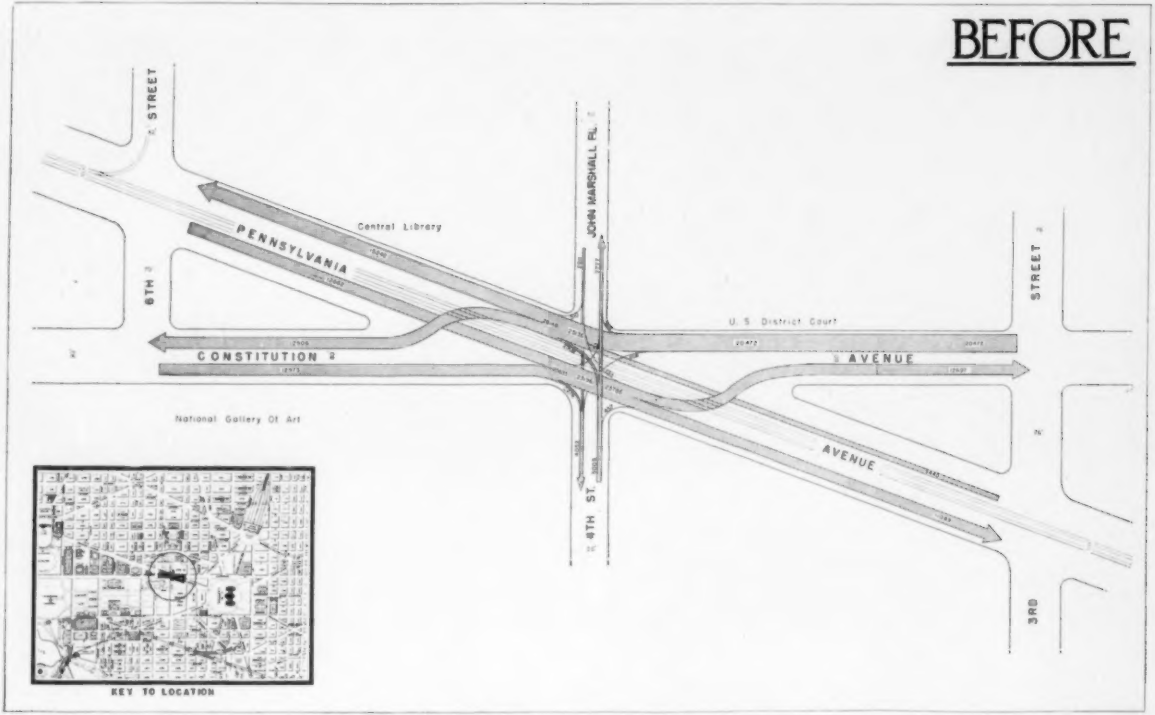


Exhibit 1: Graph Plan of Intersection Before Islands

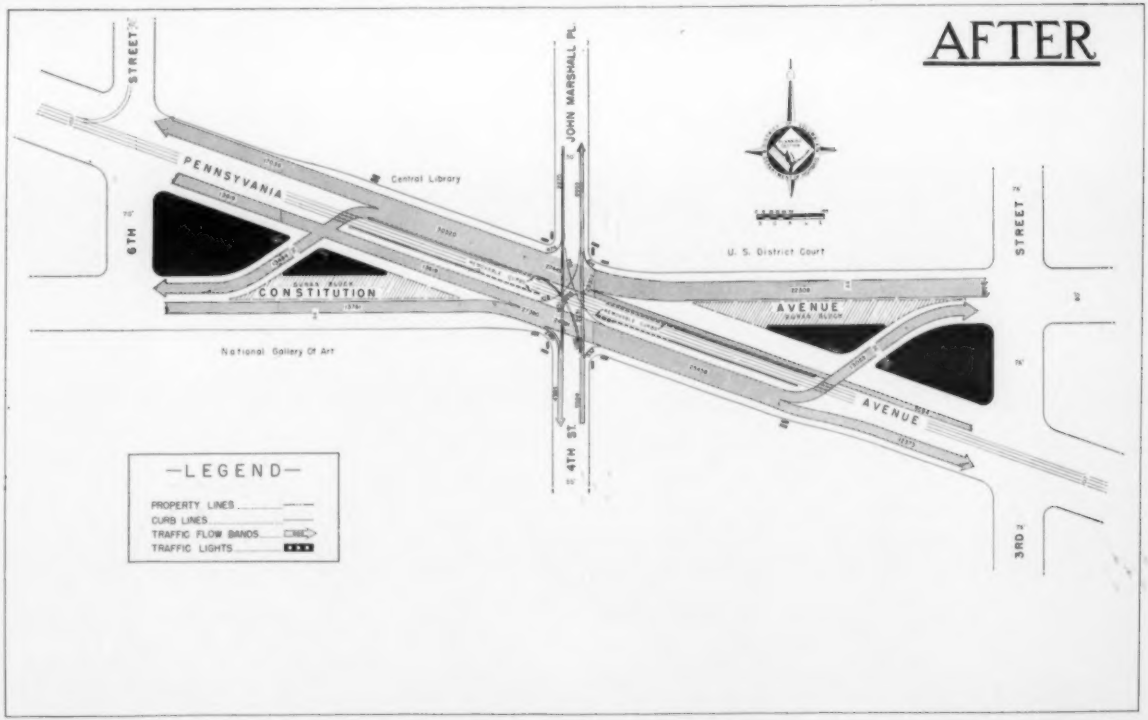


Exhibit 1: Graph Plan of Intersection After Islands

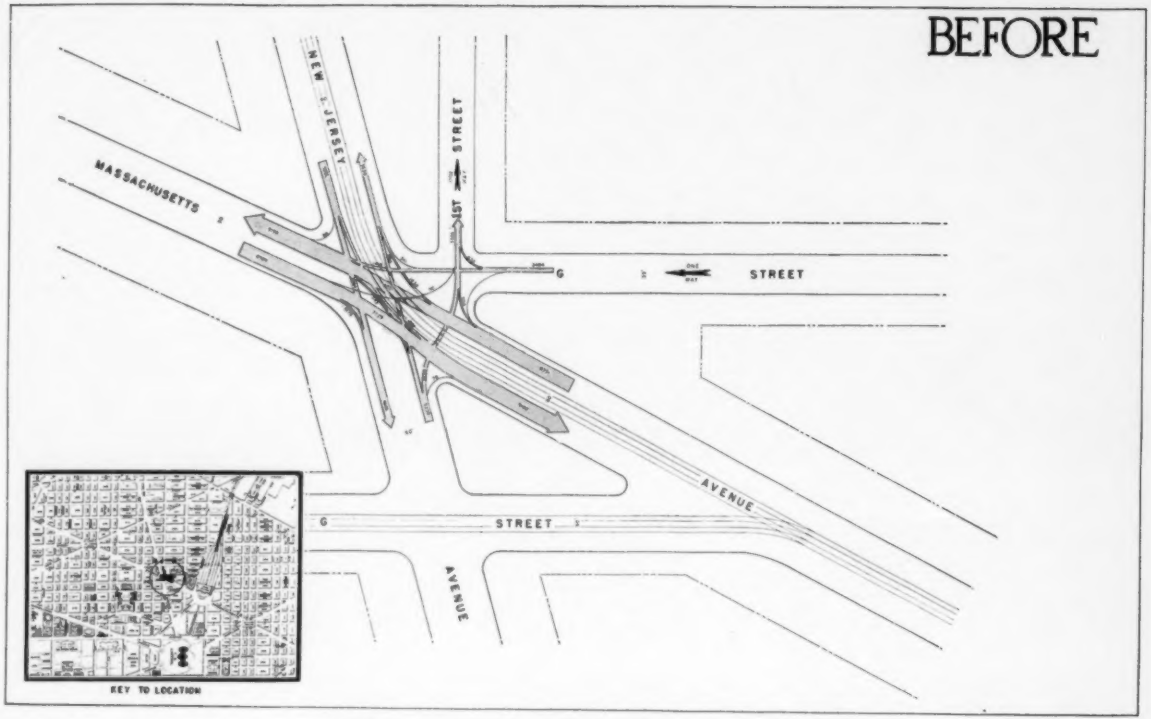


Exhibit 2: Graph of Intersection Before Channelization

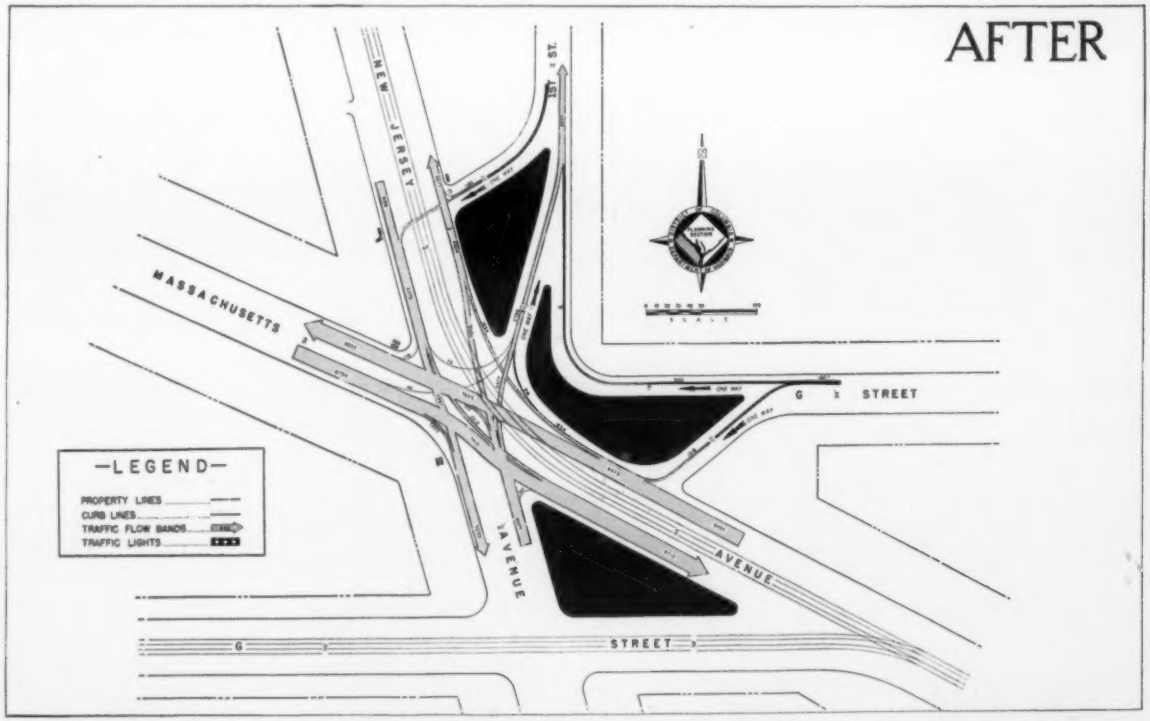


Exhibit 2: Graph of Intersection After Channelization

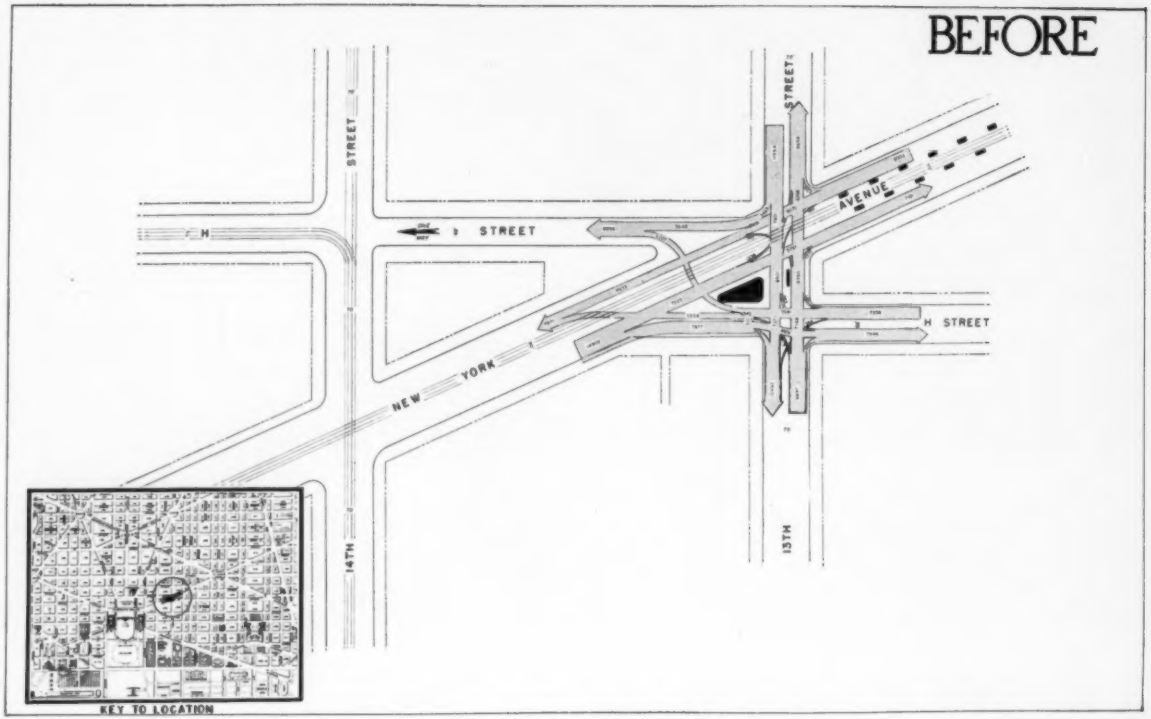


Exhibit 3: Graph of Intersection Before Re-Design

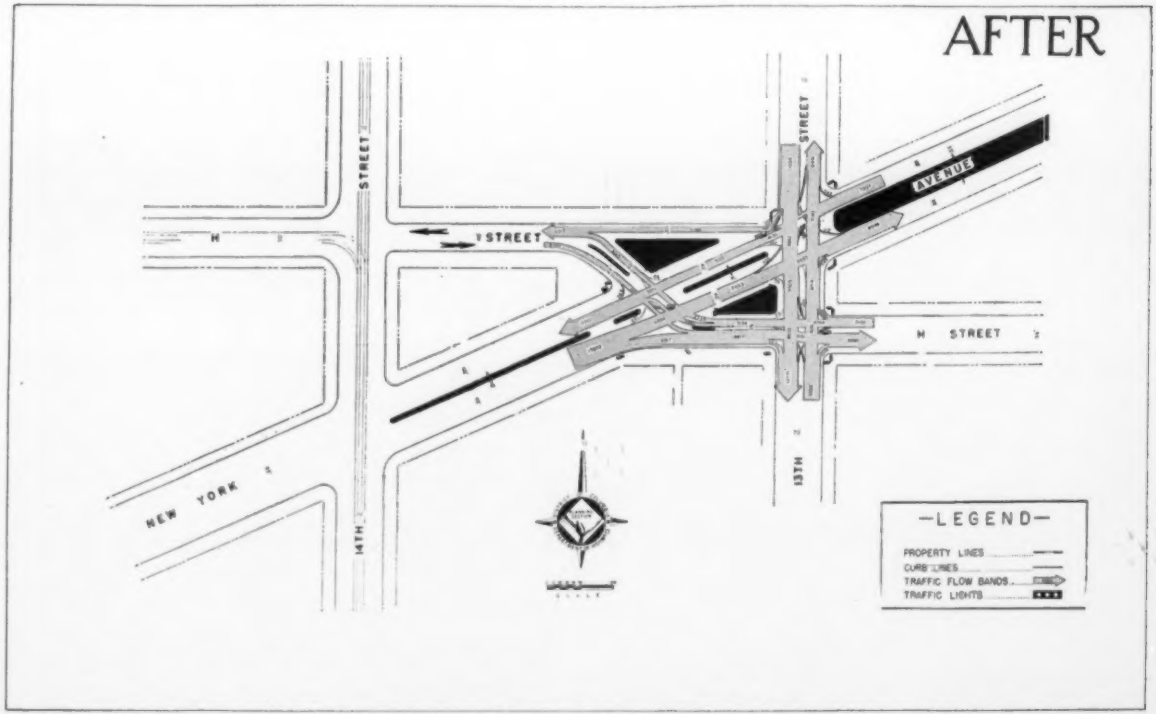


Exhibit 3: Graph of Intersection After Re-Design

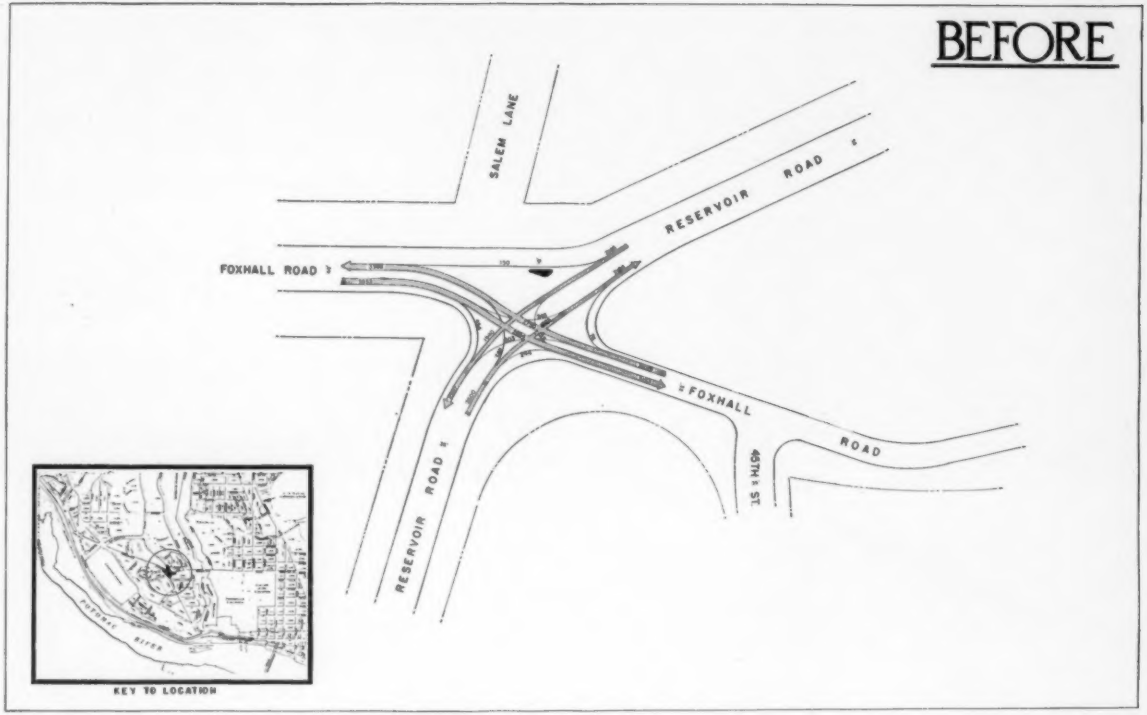


Exhibit 4: Graph Plan Before Channelization

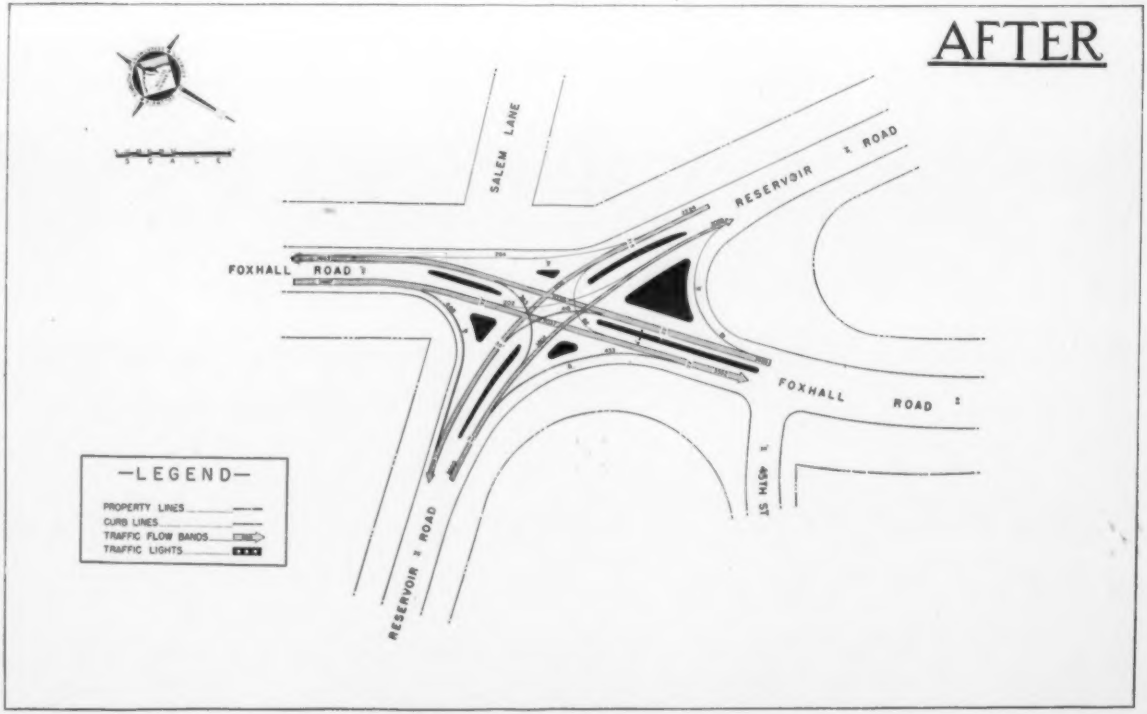


Exhibit 4: Graph Plan After Channelization

"After" Channelization, New York Avenue at 13th and H Streets N.W., Washington, D.C.

diagonal avenues. The "wide-open" spaces, formed by the intersection of diagonals and reached through long-tangent approaches, were found largely responsible for erratic and improper driving. Although local drivers, having acquired skill through familiarity, were able to manage without too much trouble, visitors to Washington were often confused and subjected to unnecessary hazards. But regardless of the degree of skill attained by the operator, his judgment cannot be relied upon to come up with the ideal, or even fairly accurate adjustment to problems thrust suddenly upon him while in motion. He needs coaching.

Channelization can therefore be defined further as a positive, objective attempt to relieve the driver of the responsibility of having to make too many split-second decisions. This is accomplished by eliminating all possible causes of conflict attributable to the highway itself. Geometric lay-outs are therefore designed to make the roadway the dominant factor by means of well-defined paths. Confusion is lessened by providing connecting channels between entrance and exit points which appear instantly as the most natural and the easiest maneuver.

Achieving a Necessary Margin of Capacity

As the exhibits accompanying this article indicate, this method of treatment for the typical intersection in Washington has been fairly extensive. The peculiarities and characteristics of the street system previously mentioned were susceptible to such treatment, particularly in the large intersections. This technique at any rate has succeeded in reducing intersectional friction in most cases by restricting vehicles to mutually tolerant courses through unusual and irregular facilities. In general, the necessary margin of capacity has been realized without having to resort to more expensive construction.

As studies of the problem of the urban intersection continue under the goad of ever-increasing traffic pressures, there is little doubt that, except for facilities of secondary importance, channelization treatment exclusively on the surface is losing ground. This situation springs from the fact that street systems are composed of

blocks and intersections, and the main trouble lies in the lack of balance between the capacity of each.

Theoretically, the carrying capacity of the city block is limited only by the number and width of traffic lanes, and by the nature and composition of the traffic which runs through them. On the other hand, the intersection at grade, which is the necessary product of the grid system of streets, is limited because of its very function as an interchange. Traffic converging upon its common area from two or more directions cannot be absorbed, sorted and dispersed with anything like the entering rate of speed. The answer, of course, is three-dimensional movement or the provision of another horizontal plane by means of a grade-separation structure.

The value of fully controlled intersections on depressed or elevated structures is becoming increasingly apparent as the only way to segregate opposing traffic. This technique of intersection design is becoming a progressively important objective of highway departments.

The following projects are examples of grade intersection treatment in the Nation's Capitol:

Exhibit 1

Located between the congested Federal Triangle and the US Capitol, this intersection is formed by the gradual convergence of two heavily-traveled east-west arterials, Pennsylvania and Constitution Avenues, at a point bisected by 4th Street, a minor north-south street. The combined traffic volumes entering from the two major streets are approximately 55,680 vehicles during an average 24-hour weekday, or about 88 per cent of the total entering flow.

Prior to reconstruction, traffic devices controlling merging movements consisted of stanchions and painted lines in conjunction with signal lights. During off-peak hours these were sufficient to handle comparatively light traffic. Under rush hour conditions however, they proved unsatisfactory principally because they were not positive enough in delineating the correct paths which should be taken over the critical section of the common roadway, and did not provide adequate weaving distances.

In order to promote more orderly use of the intersection, the wide expanse of pavement was reduced by the construction of geometrical islands. It was necessary to permit traffic from both major streets to flow simultaneously and merge in the extended lanes between the intersection proper and the "bending lanes" which were provided at light-controlled points at either end of the critical area. The length of merging space simplifies weaving, and channels traffic into the proper lanes before proceeding on the green light.

The streetcar rails were left in place, but the track zone was converted into the equivalent of a wide center strip by means of curbs which seals off free-wheeled vehicles. Certain sections of this curb are removable, so as to allow unobstructed passage of vehicles and marchers in processions over these two famous parade routes.

Contrasting pavement sections in the reduced areas of Constitution Avenue, constructed of rough surface granite blocks set about 1 inch above the finished grade, were included in the design. These sections served the dual purpose of controlling over-large driving areas and still permitting the passage of marchers and parade vehicles.

These design improvements, supplemented with relocated and retimed signal lights, brought about easier, safer and more rapid distribution which resulted in an increase in capacity of over 20 per cent.

Exhibit 2

The "Before" sketch shows a typical intersection produced by the convergence of diagonal avenues into a point on the grid system of streets. Prior to reconstruction some 30,000 vehicles passed through the facility during an average 24-hour weekday, with the major arterial, Massachusetts Avenue, carrying over 50 per cent of the total flow.

There were no left turns permitted from Massachusetts Avenue into New Jersey Avenue, a restriction which forced some users to make a wide detour in order to regain the direction desired. On the other hand, both northbound and southbound traffic on New Jersey were allowed to turn left into Massachusetts Avenue.

This heavy turning movement created conflicts and serious de-

lays which slowed down the performance of the intersection in general. A double streetcar line running from New Jersey Avenue into Massachusetts, and another running east-west on G Street and merging together east of the intersection added seriously to the congestion.

The lesser traffic flows on First and G Streets were often denied free access through the intersection which, during peak hours, became jammed with traffic entering from Massachusetts and New Jersey Avenues.

As the "After" drawing shows, the original design was corrected and rendered more efficient by channelization at the northeast corner of the intersection. Although the major traffic flows continued to receive preferential treatment in the form of maximum pavement space, the minor stream of vehicles on First Street was provided with a direct connection into New Jersey Avenue. First Street prior to reconstruction was one-way northbound. Traffic entering from G Street was also given a better chance of passage into Massachusetts Avenue by means of a similar connecting channel. Controlled by means of signals timed to give more green time to Massachusetts and New Jersey Avenues, interference with the heavy traffic on these was effectively prevented by "bending" First and G Streets' traffic away from the point of conflict.

Although the physical area of the intersection was reduced somewhat by the emplacement of geometrically designed islands and separators, the well-defined paths through the intersection, and the absence of friction at entrances and exits made for a more orderly traffic operation and resulted in more real capacity.

Exhibit 3

This unusual intersection is located in the downtown section of Washington which is the destination of over 172,000 work and shopping trips made by all modes of transportation during an average 24-hour weekday. The intersection consists of an extremely important north-south arterial street, 13th Street, and New York Avenue which is an equally vital diagonal route leading into the central area. H Street is off-set at this point (see drawing), and prior

to redesign, was restricted to one-way westbound movement between 13th Street and 14th Street. This restriction allowed traffic to drain off the intersection by permitting right turns only, and to some extent relieved the pressure and congestion in the intersection.

Because of the high cost of widening streets bordered by valuable commercial real-estate, it was decided to meet the need for more highway capacity by reopening H Street to two-way traffic. Wherever possible, maximum benefit should be derived from existing facilities before undertaking expensive construction. A channel to accommodate east-bound traffic on H Street was cut through a small triangular park, the apex of which was widened by eighteen feet as a barrier to the passage of vehicles into the short one-way section of H Street beyond the channel. This serves to deflect some 2100 cars per day from the main area of conflict in the intersection by allowing them to cross New York Avenue traffic in a special channel, and thence emerge on line with the offset portion of H Street. All movements are governed by light signals which favor the principal traffic flows on 13th Street and New York Avenue.

The reopening of H Street to two-way traffic restored this important crosstown feeder to its full capacity. As a result of this improvement, the intersection functions more efficiently as an important link in the downtown street system.

Exhibit 4

Channelization at this location was undertaken in connection with the re-alinement and general improvement of Foxhall Road. This highway serves as an important connection between residential areas in Northwest Washington and in nearby Maryland, and US 50 via Canal Road and Key Bridge to Virginia. It also connects with the downtown district via the Whitehurst Freeway along the north bank of the Potomac River.

Because of its location on the outskirts of the city, where vehicle speeds are higher than in more congested and thickly settled sections, the conflicts in this intersection were serious, more from an accident standpoint than from trip delay. The need for engineering treatment was also indicated by the fact that the lines of approach on

both streets were on long curves and rather steep grades which limited adequate sight distance.

Redesign in the form of widening, re-alinement and geometric islands permitted continuous right-turning movements in channelized paths. Separator strips served to segregate opposing traffic on both Foxhall and Reservoir Roads. Conduits were put in place so that future traffic light control could be installed without cutting the pavement slab.

To sum up, any intersection channelization plan should be aimed at the realization of three principal objectives, (1) the reduction of confusion and conflict, (2) increase in operating capacity, and (3) a material elimination of undue hazards to both drivers and pedestrians.

Although little reference has been made to the pedestrian in this discussion of engineering methods for the improvement of intersections, this component of traffic must figure importantly in any scheme designed to promote orderly movement across their common areas. Consideration should therefore be given to the provision of adequate protection for pedestrian traffic by means of properly controlled crosswalks. Standard control devices and signing are a most important factor in the well-designed intersection.

Another essential feature—and one that is often treated too casually—consists of adequate street lighting. The emplacement of islands and other methods of channelling traffic will improve conditions only if provision for night-time visibility is incorporated in the project.

Finally, it may be proper to mention here the recent work of the Highway Research Board Committee on Channelization. A preliminary draft of the findings of this committee, tentatively entitled, "Typical Examples of the Application of Channelization in the Design and Redesign of Urban and Rural Highway Intersections at Grade", has been completed and submitted to the Board for consideration and disposition regarding publication.

The value of this compilation, which includes examples of channelization work on a nation-wide scale, will certainly prove of major importance to those engaged in this field of highway engineering.

Small Town Parking

A. M. WHITE

Mr. White has been Assistant Engineer of Maintenance for the Mississippi State Highway Department since 1938. His duties consist primarily in the supervision of the signing and signalizing of the Mississippi highway system. He is a member of the Institute of Traffic Engineers.

NORMALLY, when we think of parking problems we think of large cities with great volumes of traffic and large buildings. These cities have such high real estate value that all available space is used for stores, offices and other buildings with no open spaces for parking lots. The streets are so congested that it frequently is necessary to prohibit parking on the streets so that moving traffic can flow.

The small towns (of 5000 population or under) have parking problems quite different from the cities. In the small town you normally have a main street or town square where stores are located. Practically all buildings are one or two stories high, and you find large open spaces reasonably close to the main shopping area. Usually no large generators of traffic are in the business district. This business district is made up of stores, doctors' and lawyers' offices and an occasional small business.

Few Small Towns Have Commercial Parking

In the large cities the residents soon realize that they cannot drive close to their destinations and find a parking place. They soon learn they must park in garages or lots several blocks from their place of business and walk. Studies show that small town residents insist on being able to park at or within a block of their destination. If they cannot find this parking place they will drive to some other store which has available parking space.

Normally you do not find commercial parking facilities in small towns. There is not enough demand for this type parking to justify

the installation of a parking lot and pay the cost of operation. Parking lots in this size town are usually constructed by the municipality and no charge is made for space. You will find an occasional garage or lot operated in connection with a hotel for its guests but these cases are rare.

Throughout most of the South you usually find the manufacturing plants located on the edge of town. The manufacturing plant in the small town has its own parking area which provides ample space for its employees. These plants give little trouble and when a complaint is received officials of the company are anxious to assist in providing space for their cars and are willing to spend funds to improve the lots. The best approach we have found in these cases is to discuss the problem with the owners or manager. If you can show him how he can improve his parking facilities without a large expenditure of money you will find he is anxious to help. The plant usually owns or can lease property nearby and it does not cost much to clean it and gravel-surface the lot. You will notice that, once you get a lot established, the plant owner or workers will improve it until there is a good surface.

The primary trouble in the small town is the lack of control and planning. These towns have a low tax income which must be used for schools, street improvements and maintenance, fire and police protection, and a multitude of other expenditures. The homes are set on large lots. This causes the population to be spread over a large area.

One of the first expenditures to be cut is in the traffic control section of the police department. This means that they cannot buy signs or paint for properly posting or marking traffic regulations. It also means, in a number of towns, that the police have inadequate or no transportation for police traffic duties. It is not an uncommon occurrence to go into a town and find that they have only one policeman or marshall and possibly a night watchman. This policeman finds soon after taking office that he has more than he can do so he soon loses all interest in parking.

Ways to Approach Parking Problems

This lack of control and interest leads to a condition in which anyone parks wherever he pleases and the streets are congested. We get called in sometimes for an investigation, either by a civic club, the town officials, or some interested citizen. Usually, if it is affecting one of the state highways we start the investigation before anyone else takes the initiative. If the request originates with a civic club or individual we discuss the problem direct. Before any study is made or any corrective action is taken we invariably consult the mayor or other elected officials and go over the problem.

If the town officials appear interested and there is evidence that they will try to carry out a plan to correct the condition we study the problem and make suitable recommendations. If our conference with the officials indicates the complaint is not valid we delay our study until such time as some other condition arises and combine the two.

There are a number of different ways this study can be made and the results presented to the town. In several cases we have asked our planning division to make a parking study which included a comprehensive survey of the street use, spaces available, demand, available lots close to the business district, and other pertinent factors.

One of these surveys was completed and the results analyzed. The finished study and complete recommendations were printed and bound in a volume. The cause, effect, and the cure were well presented. The study was complete even to the number and types of signs and pavement markings needed to put the plan into effect. The town assisted in the collection of data and was interested in the study.

When the report was presented to the town something happened. We don't know what it was but the plan was never carried out. Some minor parts were adopted but conditions are not much better. I (and this is a personal opinion) believe that the report frightened them. They were a group of small town business men and when they saw that big report with charts, flow diagrams, quantities of figures and other data with which they were not familiar they quietly placed the report on the shelf and forgot it.

Best Results from Simple Report

I have found that I get the best results by making an informal report in the form of a letter with necessary charts or diagrams attached. This letter is usually three or four pages and all technical references and terms are omitted. Emphasis is placed on the benefits to be derived by the town and the traveling public. Solutions to the problem are given and the cost to the town is set out. After this letter is received by the mayor a personal call is made to answer any questions.

Some conditions the officials of these small towns can remedy by themselves without aid from any state department. The first is the correction of the practice of double parking. This can be corrected by a little impartial attention by the local police. Bear in mind that no enforcement program will succeed unless all violators are treated alike.

Another serious condition found in many small towns is the practice of parking too close to intersections and in some cases we have found parking stalls marked off, with parking meters, across a crosswalk. The town officials are more interested in the revenue from the meters than they are in the safe movement of traffic. You frequently find there are no pavement or curb markings. This is often caused by the high cost of applying paint lines or curb markings by hand. Some towns use the town prisoners for this work.

Others own small hand-operated paint machines that will do a satisfactory job on parking stalls. In some towns the officials will find that large trucks can be routed to load or unload on back streets or alleys. This might mean the improvement of the surface and the prohibition of all day parking in these alleys. The town officials should look around the business district for vacant lots which can be improved for the parking overflow off the streets for the people who park all day.

The officials of any town should prepare a plan for future expansion. This plan should provide space for future off-street parking facilities. As the business district grows and new buildings are added, the owners of these buildings should be required to provide parking space for the tenants and customers. These plans can be carried out

at minimum expense during the expansion period whereas it will be costly to remedy the congested condition at a later date.

We have noticed a strong trend by the small towns to use parking meters. These meters aid in the enforcement of the parking regulation, encourage turnover, and are a source of revenue for the Town Police Department. The use of meters has enabled some of the towns in Mississippi to employ and equip traffic police who would not have been employed through property taxes. If the revenue from meters is to be used for this purpose we recommend their installation.

Orderly traffic movements, a reasonable amount of impartial enforcement of traffic laws, availability of parking space and cleanliness of the streets and store fronts are some of the best advertising measures a small town can take to insure a continued growth. With good highways, shoppers soon learn they can save time by driving ten to twenty miles to another town where parking is available and where traffic is handled in an orderly manner. Persons are prone to think in terms of time rather than space, and if the distant town wants the business you will find that shopping is soon combined with a pleasure drive.

Town officials will find that the State Highway Department engineers are anxious to help them solve their problems so long as they are sincere in their requests. Civic clubs and local groups should work through the town officials in dealing with the state department. Any project or traffic improvement program sponsored by a local group must be coordinated with the plans of the town officials.

Small-town parking is not the same today as it was ten years ago. With more income for the small business man, more cars are being bought. This causes parking conditions not anticipated when streets and highways were being planned. But with a little cooperation from everyone concerned, conditions can be remedied and many accidents avoided.

And the small town parking problem will be improved.

Some Traffic Factors in Urban Planning

LAWRENCE MOORE

Mr. Moore is an architect who has turned to town planning. For the last six years he has been a member of the Technical Planning Associates group in New Haven, Connecticut. This organization has contributed to the general planning activities of communities in the northeast. Mr. Moore is a member of the American Institute of Architects and of the American Society of Planning Officials. From 1927 to 1942, he practiced architecture with a New York City firm working with residential, institutional, and industrial buildings, and with housing and institutional site planning. Later, he was associated with a New York City firm of architect-engineers for army construction. He was resident site planner at Camp Shanks, N. Y., Camp Kilmer, N. J., and other army projects. He is past Secretary and past President of the Connecticut Chapter, A.I.A. He is Director of the Fairfield County, Connecticut, Planning Association, and Chairman, Town Planning Committee of Wilton, Connecticut.

TRAFFIC arteries may at times be dangerous weapons in the hands of the planner. No other factor in his work has so great an effect on the development of the community. The creation of a new super-highway brings added throngs to an area. The locations of its traffic interchanges affect the future use of nearby properties; conversely their absence on sizeable stretches of the highway may tend to check the development of intervening sections.

As fast as new facilities are built they appear to tap new and unforeseen sources of traffic. It is almost universal experience that new expressways attain in a relatively short time the volume of traffic predicted for a number of years later. Even lesser projects and minor thoroughfares bring change in the community pattern. Many an older avenue becomes run-down when a new artery takes away its importance. A new routing of traffic through existing streets by nothing more than a change in directional signs may affect some business man's income.

Among normal capital expenditures for public projects made by all levels of government, highways represent the largest slice. In no other field is there such a continuing program, either of planning or of design and construction. In addition to publicly constructed highways, we find builders laying out countless streets in new developments. These, though privately constructed, are more or less under public planning control. Of all the component factors in the execution of the community's long-range plan, highways are the most widespread.

Avenues and boulevards of old cities were neighborhood centers in themselves. In the days of slow-moving traffic, people could cross without too much difficulty and there was a community of interest between the two sides of the street. But today's major thoroughfare

The modern expressway can be an effective separation between neighborhoods or an unfortunate barrier in the middle of a community

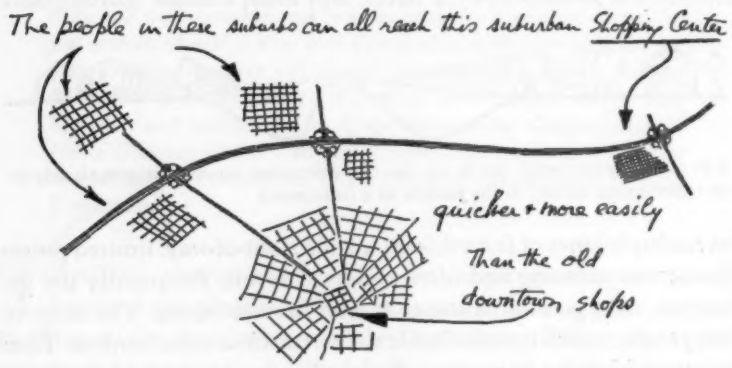
has multiple lanes of fast vehicles, a wide right-of-way, limited points of access or crossing and often different levels. Frequently the pedestrian must go some distance to find his way across. The noise of heavy traffic makes it undesirable to live too close to its borders. Thus the super-highway becomes a distinct barrier in the middle of any community it traverses.

Expressway May Be Barrier

This barrier can do great harm, or on the other hand, it may be used effectively as part of the whole community plan. Present-day expressways and parkways are generally designed to present an attractive appearance. They often serve to maintain a considerable amount of open space and landscape treatment. Having restricted access, they do not become quickly lined with gas stations and hot dog stands. Hence they have not the bad characteristics of the old type of main highway.

If this belt that express highways create is in the right place, it serves to separate areas of differing use-characteristics or logically distinct residential areas. On the other hand, if it suddenly cuts through the middle of an established neighborhood community, the effect is like that of a main line railroad. Infrequent crossings tend to isolate people on opposite sides from each other. The community is split and no longer functions as a unit. The barrier effect of the super-highway makes it essential that the route should be in keeping with the overall plan of the whole community.

Another result of the new traffic artery is the tremendous change it may bring in the travel-time pattern of the community or of the region. A new express highway makes it easier for people to travel


The people in these suburbs can all reach this suburban Shopping Center
quicker + more easily
than the old
downtown shops

further in less time than by their old accustomed routes. The new network sometimes creates points, generally in outlying sections, that are more accessible time-wise to a greater number of people than the old city centers. Residents of the central parts may reverse their habits and go outward to shop. Or they may choose a residence at some distance from their work, but reachable by expressway in less time than a nearer location without such a connection. Habits of travel in the community are more the result of time than of distance. They are easily changed when a new and quicker route is offered. The effects of this on community development should have a larger place in the studies leading to the location of arterial highways.

Proper Planning Important

Much of the importance of proper planning for modern thoroughfares at this time lies in the fact that large portions of the routes covered by these projects lie in areas where some kind of development is taking place or is imminent. These are areas that are now changing from rural to urban in character. They include the outlying suburban communities of metropolitan regions, where the most houses are now being built and the greatest number of streets laid out.

Modern transportation has changed the meaning of the word "urban." The city has been replaced by the city-region. It is no longer a single compact locality, but an agglomeration of many communities. Urban living spreads over a wide territory, hence urban planning is for the urban region and not merely for the central city. We are apt to lose sight of the geographical extent of urban living today; we do not yet realize the spread of the urban community.

Decentralization became evident with the advent of the motor car. No compact city-center has grown up since automobiles became universal. People seem to prefer their own cars to any form of mass transportation when conditions permit their use without excessive hindrance. Thus Los Angeles, wholly developed as a great metropolis in the motor age, has spread over a tremendous area, dependent almost entirely on motor vehicles. Its urban functions take place in an entire city-region. It is no coincidence that there is an automobile to every two-and-one-half persons in Los Angeles compared with one for eight people in New York City.

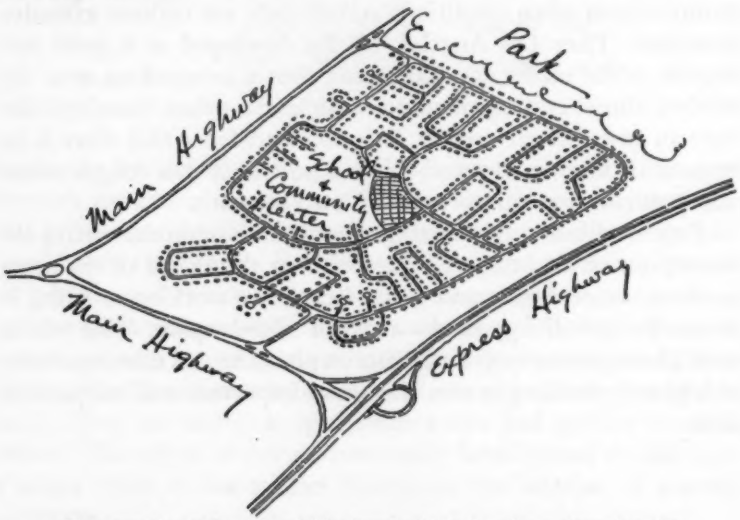
Decentralization is occurring everywhere within the metropolitan regions of the country. Even without the threat of the atom bomb, many economic and social factors are working to bring it about. Today's living needs—and can afford—space. This whole trend places greater responsibilities on planning and most especially on highway planning as one of its most important and inseparable parts.

Planning for Urban Region

The purpose of planning is to provide space for the various human activities—living, working, recreation, services—and to provide circulation between these spaces. The old concepts of urban planning were based on communities inhabited largely by pedestrians. Angular blocks and sharp corners were a logical result of pedestrian or animal circulation. Compactness was made necessary by limitations of human speed. Therefore the city spread out in a single mass interrupted only where a park or a public building might break the monotony.

The motor vehicle has created a new pattern of street design with curves of large radius demanded by higher speeds. It requires room for moving, room for turning and room for parking when not in use.

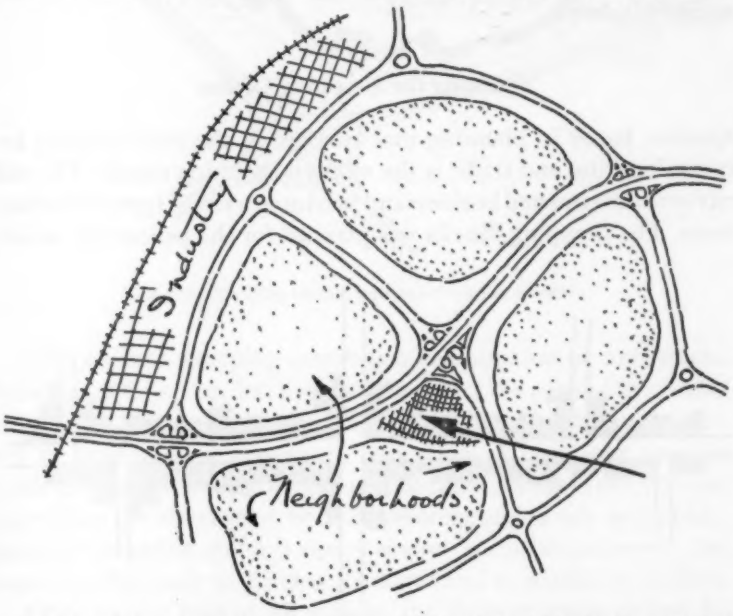
Today's means of circulation and the resulting decentralization have fostered a growth of smaller neighborhood communities. New residential districts have lower density of population. With all the space available, congestion is no longer necessary. The advantages of the smaller community are major factors in drawing people out to the suburbs.



Tomorrow's residential neighborhood will be free from through-traffic

To provide good environment for living is the objective of planning. A good neighborhood appears to most people to be one large enough to provide desirable community facilities, yet not too large. It must be near to open spaces for recreation, yet convenient to central resources for business and services. The elementary school has proved to be a good measure of the size of a typical neighborhood and this corresponds to a population of from two or three thousand in suburban areas to eight or ten thousand in city areas. The residential parts of the city-region of the future will be made up of semi-independent neighborhoods like this.

Much has been said about traffic and residences, about safety and children, and it goes without saying that residential neighborhoods should be free from all but their own internal traffic. Yet frequently we see neighborhoods or good potential neighborhoods ruined by the intrusion of through-traffic. When volumes on principal city avenues become too heavy, traffic seeks its own relief by using minor



Traffic arteries can create a good pattern of residential neighborhoods and other land uses

feeder streets. This brings the commonest complaint to city officials: heavy truck traffic has suddenly taken to using a once quiet residential street.

Obviously neighborhoods should be a major factor in traffic layout. Arterial routes of all kinds should be placed between neighborhoods and not through them. In any new area, thoroughfares and neighborhoods must be planned together, taking advantage of topography and natural conditions for both. Traffic arteries, both major routes such as parkways or expressways, as well as minor thoroughfares of local importance, should be laid out to create the pattern of neighborhood areas. When the neighborhoods themselves are designed, they in turn should be laid out so as to discourage any but access traffic. In general, houses should be reached from the interior streets only and should not front on the surrounding thoroughfares. The interior streets of the neighborhood should intersect the thoroughfares at as few points as practicable and of course with due regard to safety.

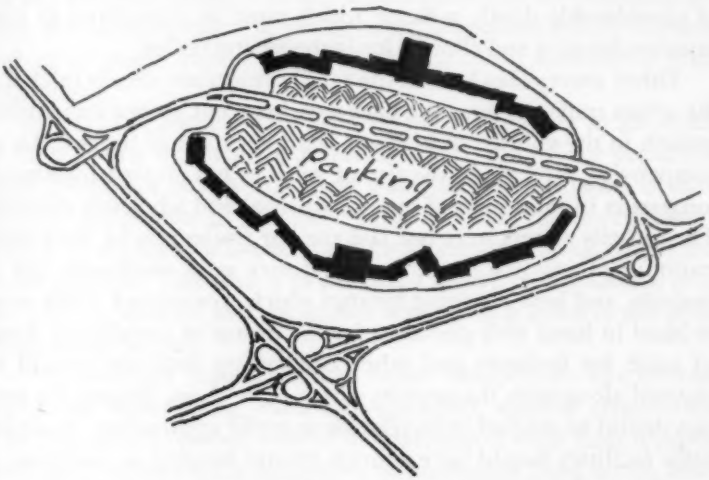
Planning the Shopping Center

Another factor in planning that emphasizes the close relation between land use and traffic is the modern shopping center. The old city avenues attracted business and produced a string type of development. The shopping district was planned for the pedestrian, which

The old shopping center stretched along an avenue

produced a crowding of business as near as possible to some central point. This in turn created high land values, and consequently a tendency to cover the entire business site with buildings.

Today's business is closely related to motor traffic. Every city experiences the problem of moving vehicles into its shopping areas and managing them once they are there. General decentralization of the population has given an impetus to business in suburban areas and has led to an entirely new type of retail facility.



The new shopping center is planned for the motorist

The modern shopping center is a combination of commercial buildings and parking lot, designed to attract the patrons who drive by making things as convenient as possible. It has been found necessary in most of these projects to have three or even four times as much land devoted to parking as to buildings. Access to this parking space from the street must be as convenient and as safe as possible. Since the shopping center is almost always on a principal artery, this means careful study to eliminate hazards and to minimize conflicts.

Once having parked his vehicle, the shopper wants to find his way on foot to one or more stores. He is unwilling to walk very far,

as numerous tests have indicated. In the interests of safety, he should not have to cross any busy traffic stream. Therefore the tendency is to concentrate the new shopping center on one side of a street only, and on one corner of an intersection.

The traditional store is based on show window length, or frontage, with relatively small depth of property. The new commercial project takes much more space. Its shops may be disposed in a horseshoe around a large parking space, so that the street frontage is small in comparison to the amount of store space. But it requires property of considerable depth, a factor which must be considered in community planning and allowed for in the zoning layout.

Other enterprises besides the retail centers are closely related to the urban traffic pattern. We have seen in recent years a tremendous growth in the volume of highway transportation of freight. An accompanying increase in the size of vehicles has created intolerable congestion in the streets of many industrial and wholesale districts. The old city streets were not laid out for trailer trucks. Decentralization is taking place rapidly in industry as in residences and in business, and land planning for uses which create truck traffic must go hand in hand with planning for the means of circulation. Areas set aside for industry and other truck-using activities should be planned along with the arteries which serve them. Zoning for such uses should be studied in its relation to traffic approaches. Available traffic facilities should have a much greater bearing on decisions to permit uses that generate an appreciable movement of vehicles.

It goes without saying that provision of parking facilities is a major planning problem in the old city-centers and that the absence of such facilities is a leading cause in the move of decentralization. Limited access arteries solve the problem of interference of curbside parking with moving traffic by eliminating the parking altogether. However, they dump untold numbers of vehicles at the destination points. Solution of the parking problem is not a simple one, and varies with the size of the community. Wherever practicable, and certainly in all new areas, zoning regulations should require off-street parking in connection with all uses needing vehicular access. This is equally true of off-street truck loading and unloading spaces wherever such transportation is a frequent factor.

Urban Highways Affect Rural Roads

The spread of the urban community has given new character to erstwhile rural roads on the fringes. Urban highways no longer include only city streets. They comprise the whole system of circulation in the entire metropolitan area, parkways, expressways, throughways, freeways, or whatever the name, together with the numerous connecting links and lesser arteries. New techniques produce a new expression of the plan. Urban life has always centered about the important street crossings. The old market place and the public square were the meeting place of pedestrians. Tomorrow's Fifth Avenue and 42nd Street will be at the giant clover-leaf crossing of great expressways.

In a typical gridiron city plan, all streets are more or less equal in their ability or inability to handle traffic. Except for occasional great avenues or boulevards, there was little differentiation in their relative importance in the traffic pattern. There has always been a failure to distinguish between the two functions which streets and roads perform. The first is to provide a means of circulation from one place to another and the second is to provide access to the properties along the way.

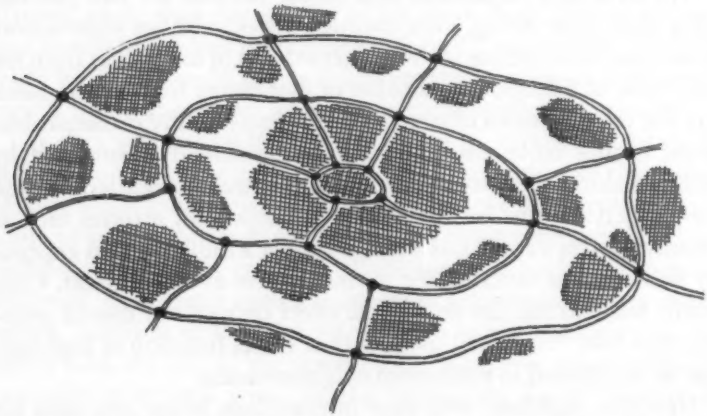
We have now discovered that motor vehicles are like railroad trains that move along, even through cities, without obstruction. These could not operate without a separation of main lines from the yard traffic of sidings, a separation of movement from access. Similarly the two functions of streets have become totally incompatible. Traffic cannot move efficiently if it is continually obstructed by vehicles seeking access to properties and it is well recognized that the access function must be divorced from important arteries such as parkways or freeways. Thus a single lane of a limited access expressway will carry as much traffic as four or five average streets. Conversely, heavy traffic has an adverse effect on so many uses of property, especially residential uses, and the travel function of highways must be minimized in residential neighborhoods.

New thoroughfares with new intersections create new sites for business centers of various kinds. The pattern of residential neighborhoods is closely interwoven with the scheme of traffic

arteries. Use of land for other purposes, such as industry, wholesale distribution, institutions and recreation, is also greatly influenced by the location of principal routes. Hence the need becomes all the more apparent for a completely coordinated system of circulation in the entire urban area. Yet in most of our urban communities, many and often overlapping jurisdictions make it difficult to achieve even a small measure of coordinated planning.

Today's urban community is no longer confined to the area under one city government. The metropolitan region of New York City extends over an area governed by 550 cities, towns and villages lying in 22 counties and 3 states. Adding up the total of state, county and municipal departments that plan and build highways, parks, schools, sewers and other public works and that exercise a control through zoning over private property would produce a staggering number.

Even in a smaller community the central city is often surrounded by several independent towns or villages and by one or more county jurisdictions. State highway departments may plan the major thoroughfares, while city, county or local departments plan the lesser ones. All too often these are planned as separate projects, built under the pressure of needed traffic relief and without adequate con-



Will the city-region of tomorrow be a well planned community or a sprawl of unrelated development? The pattern of circulation and of land use will give the answer

sideration of each other or of other problems in the areas they traverse.

Many examples of independent planning of highway facilities prove unwise in the light of the overall picture. Although most highway planning is based on a demonstrated need for a particular facility, it is impossible for the independent highway planner to know what other influences will be at work to change the future aspect of the community. Nor can he realize all of the effects his work will have on the usefulness and value of land involved. Coordination of traffic planning and of planning for the best possible use and development of land is essential before the community ideals can be achieved. Better regional organization is required to step over the political boundaries that separate the municipal entities of the urban community as well as the functional boundaries that separate the governmental departments whose activities determine the physical results: highway, park, school boards, sanitation, housing authorities, zoning and others.

All of this raises the question as to whether even the best coordinated effort of planning can be carried out fast enough to transform the old centers of the great metropolitan cities into patterns which present day standards of traffic circulation and of functional use require, before they are overwhelmed by the pressure of decentralization. From the point of view of traffic and indeed of many other factors, a second question arises: Whether it is even desirable to try to preserve intact the old central cities or whether to utilize the greater spaces outside for better traffic facilities and so give way to the trend of decentralization. The automobile, long before the atom bomb, has made the old city-center obsolete. We are in a period of transition between the unbridled growth of the bigger and grander metropolis of yesterday and the urban region of tomorrow. In any case planning for circulation is an integral part of planning for the whole.

Let Them All in the Act

LEON W. CORDER

Mr. Corder, a graduate civil engineer, after holding various engineering positions with the Missouri State Highway Department, is now Traffic Engineer in the maintenance division. He is a registered professional engineer, a member of the National Society of Professional Engineers, a former director of the Missouri Society of Professional Engineers, former President of the Jefferson City Engineers Club, and Chairman of the ITE committee on Traffic Control and Cooperation.

A TRAFFIC engineer has many "relations." One of his closest, most solvent relations is his older half-brother, the maintenance engineer. Despite the difference in their ages, an interestingly cooperative understanding has developed between them, engendered by similar interest. And already it has produced much good for the highway user.

This cooperative relationship will help make our streets and highways more safe for persons and vehicles. Yet the traffic engineer's part in this partnership has, more often than not, been misunderstood or understated.

The traffic engineer is still being spoken of as a "markerman," or "the man who takes care of signs." This is accurate as far as it goes, but it describes only a small part of his work.

For instance, he should understand public relations. And while not a lawyer, he should be capable of discussing traffic legislation with authority. In the field of design, his services should be available as a consultant and reviewer of plans. He must be capable of research activities affecting vehicles and pedestrians. And he must know how to devise and maintain the traffic controls so necessary to modern street and highway usage. These highlights suggest a few of many phases of a traffic engineer's work.

The time-space demands of this new profession, however, are actually stretching its capacity beyond the elastic limit. Public relations, legal, design, research, and maintenance experts need have no fear that the traffic control specialist is attempting to poach on

their preserves. If the traffic engineer is normally intelligent and seeking to perform his own job adequately, he will certainly have neither desire nor time, and probably not the capacity, to do other men's work for them.

In many respects it is well to have some overlapping between these professions. Limitations in the traffic engineer's makeup exist also in the public relations director, the lawyer, and the old-line professional engineer. Sharp borderlines and clearly defined limitations of prerogative would lead to ever-widening gaps. There need be no internecine rivalry; only teamwork. Each is necessary to the other. As a successful producer might say, why not let them all into the act?

In a state highway organization, these ill-defined (and sometimes unexplored) marginal areas of authority are present to a degree no more nor less aggravated than may be found in other large engineering enterprises. When the business of correlating accident statistics, vehicle performance and traffic volumes first began to affect highway design, a few designers resented "intrusion," as though hallowed ground were being desecrated.

Frequently the shoe has been on the other foot when the traffic engineer has tried his hand at channelization that might have worked properly somewhere, but did not at the location in question. It indeed takes many years to achieve common sense in the school of experience. Some never achieve it.

The more the public relations, legal, design, research, and maintenance experts know of traffic engineering, the less difficult the traffic engineer's job becomes. This is particularly true in the field of maintenance where a great many of the traffic controls are erected and maintained by maintenance field personnel. A lack of knowledge, interest or initiative in this group can sabotage an otherwise well-designed control or program.

In some respects the highway maintenance engineer has had to surmount many of the same trials and tribulations that have beset his colleague in the traffic field. While not contemporaneously so, they both in their beginnings were inexperienced in the teamwork of professional endeavor. The maintenance engineer of a few gray hairs can remember when he was spoken of as "the man who drags the roads," or "the road oiler."

The description fitted but was inadequate. As a profession, or an off-shoot from the older and broader civil engineering field, it required a number of years for its proper establishment. Its growing pains are now almost gone.

The maintenance-traffic relationship is an interesting one. Traffic engineering might almost be called *operational maintenance.* Professional transition of this sort has been noted in other lines. The time was, particularly in the railroad field, when *locating* engineers in due course became *chief* engineers—and occasionally the operating heads of their companies.

Then *maintenance* engineers succeeded to the helm because the location phase had assumed a less important role. To a certain extent this same trend may be noted in state highway organizations. Several states now have chief engineers who have been maintenance engineers, and one or two chief engineers have been *traffic* engineers.

In a profession, it is almost impossible for a man to stand still. He must either slide backward or go ahead. If he goes ahead, he usually needs to narrow his field and specialize. There is room for such specialization in all professions. The highway designers and construction men can center their attention on certain phases of the overall picture, but usually to the exclusion of others.

Likewise, some engineers, usually from the maintenance group, must concentrate on traffic engineering. State highway organizations of today are big business. It is no longer possible for one hand to steer the organization through every intricate movement. Authority must be delegated to trusted specialists.

After a highway system has been located, designed, and constructed, the operational responsibility rests largely with the *maintenance-traffic* team. Highways are built to be used by people and vehicles. Since this is true, *the system must be maintained and the traffic regulated in such a manner that the most service and benefit will be derived by the greatest number of personnel-vehicular units.*

One of the most important maintenance-traffic engineering relationships takes place during those pavement-repair operations that partly block traffic from its regular lanes and channels. Consideration must be given not only to the safety of vehicle operators and passengers, but also to the welfare of the maintenance workers themselves.

Rules of safe conduct for the men are highly important and must be rigidly adhered to; for close proximity to fast traffic often leads to a casual attitude from which injuries result.

On the other hand, vehicle operators need to be adequately warned of roadway blocks and restrictions, and to be clearly directed by flagmen. Personnel training is an important phase of this work. The day of the crippled, half-blind flagman is gone. In his place is the alert man who knows almost as much about the job as the foreman.

The placing of signs adjacent to repairs too often fails to keep pace with sign techniques elsewhere. Repair area signs are allowed to get dirty and unsightly, because it is difficult to protect them with a fast-moving crew. Too often the signs do not accurately specify the proper warning. Nobody sees "SLOW—MEN WORKING" signs in the area of a good highway maintenance crew these days. More informative, altogether better wordings are used. Yet the training in sign application is not as thorough as the training for the job itself.

The traffic engineer's field here overlaps that of the maintenance engineer somewhat, but he need only explain and sell his idea to the maintenance chief. Unless he is a glutton for punishment, he will not attempt to antagonize the maintenance expert by doing his work for him.

In the cases of traffic controls erected and maintained by maintenance field personnel, the traffic engineer again needs the close cooperation of his maintenance colleague. While the erection of control devices usually poses little difficulty, their proper maintenance quite frequently does. For some reason, many state highway organizations have difficulty in impressing upon field employees the desirability of straightening, cleaning, and replacing traffic control devices purely as a matter of routine maintenance.

The question frequently arises, "Which is the more important, the road surface or the sign?" This is not a really intelligent query, and to it there can be no true and honest answer without qualification. In ninety per cent of the cases, the road surface is more important. But any reasonable person will admit other instances where the surface is outweighed by the importance of traffic control device.

Contention that the roadway surface should *always* come first is

subject to serious doubt. It is a proved fact that traffic controls are often needed to reduce accidents on roadways having the finest surfaces. The traffic engineer has not explored this field. Much time needs to be given to explanation and teaching.

In connection with permits for access to highway right-of-way, the traffic engineer more often than not is faced with pulling rabbits out of a hat. One new development within the last two years has pointed up this problem and focused the public spotlight on it. That is the drive-in theatre. This new phase of entertainment came upon the highway administrators so rapidly that they were, in most cases, not able to cope adequately with it.

When improperly controlled and regulated, the traffic entering and leaving these theatres constitutes a real and growing hazard to our highway users. Floods of vehicles are created which the state highway traffic engineer is ill-equipped to handle because ordinarily he is operating with inadequate legal authority and fewer enforcement officers than are usually available in larger cities for similar traffic crises. Past practice, however, indicates that this is not solely the traffic engineer's problem. Sometimes the access law has given to the maintenance engineer the authority to locate entrances and exits. And since the maintenance expert's chief concern in such location is with slope or drainage or other maintenance factor, it becomes his added responsibility to work with the traffic engineer in regulating this new development.

In the case of permits for overweight and overdimension vehicular movements, the traffic engineer again has an interest. While such permits are normally the prerogative of a maintenance organization, the main interest of the maintenance engineer is in the prevention of injury to his roadway surface and structures.

When, however, the maintenance organization assists the traffic engineer by also focusing its attention on the overloaded vehicle with low power ratio, and on the overwidth conveyance that interferes with opposing traffic streams, the maintenance and traffic engineers as a *joint team* can then attack a problem which is seriously and adversely affecting roadway capacity. While this may be an encroachment upon the traffic engineer's field, he should thank a

kindly Providence for the aid, and in return give the maintenance organization his full cooperation.

Probably the maintenance-traffic team operates at a greater disadvantage in attempting to correct this evil than almost any other. While the team may know little or nothing about the economics of transporting freight and passengers by highway, and have next to no knowledge of how to design an effective power-load ratio, they do know the effect of overloaded and improperly designed vehicles on both pavement life and traffic movement.

Here the traffic engineer cannot be all things to all people, but neither can the automotive designer nor the passenger and freight hauler. Continued disagreement will hurt every agency involved. Roadways can only be designed and built as dictated by the taxpayers' wishes. The probability is therefore that concrete roads will not in our time be constructed in 24-inch thicknesses, or with 20-foot traffic lanes. Engineers, vehicle operators and vehicle designers would do well to take that into consideration, if they desire to continue their present good business. The stage is large. Carriers and automotive designers can also be used in the act.

In route usage also the traffic engineer needs the assistance and cooperation of the maintenance expert. Particularly is this true in selecting and marking detours. Detours now must provide almost as good a surface as the main highway, and its traffic controls must be of the best design. Of course, alternate routes may be used but designated detours have usually been found best when heavily traveled roads were closed. Nothing, not even a bump in the road, annoys a highway user quite as much as a detour. When he has to use one he should be given full-dress attention in the form of good marking and maintenance.

To those who will listen, many poorly directed drivers will tell tales of detour markings that were "not specific." And they all will want to wash the traffic engineer right out of their hair. Detours can, however, be made usable and pleasant to the most critical drivers. It is the joint responsibility of maintenance and traffic engineers to make them so. And there can be no better public relations for maintenance-traffic support than favorably disposed vehicle operators.

In the designation of truck, "business," or other alternate routings, much the same traffic-maintenance relationship can work efficiently as with detours. In these cases, however, the problems are more complex. The major responsibility of selection rests upon a base of *traffic* facts; whereas the maintenance phase consists of indication, erection, and maintenance. And the public relations factor should never be underestimated in selecting such routes. The traffic engineer has it within his power to make friends for his highway department through careful route selection, but his approach must be factual and unbiased. Highway users, the business drivers, and residents who live along the route, all have a stake in special routings.

The percentage is not large, yet annually a certain number of vehicular accidents may be chargeable to faulty maintenance. In some instances these may be caused by low or soft shoulders, or they may be attributable to pavement settlement and breakage. Sometimes a slippery driving surface will be the cause, and uncut weeds obscuring a sign give trouble. A careful study of accident records by the traffic engineer will reveal information valuable to his maintenance colleague. It is *team work*. Without it, a dangerous "no man's land" will grow.

Just as we need unification for national defense—or for any other large undertaking for public good—we need unification, *teamwork*, in our war against traffic accidents and for the greater safety and freedom of action by highway users. Our highway system is definitely a large undertaking for public good. To function efficiently, its maintenance and traffic engineers must count on support from designers and construction men, public relations and legal talent, and researchers—and on teamwork from each other.

Automotive designers and commercial vehicle operators are also essential to the cooperative effort for quick, safe, and rapid transportation. Consequently the work has a better chance to succeed with the designers and operators on the team. And unless the team can count on support from highway users, efficiency will be decreased.

As traffic engineers, we must have the maintenance experts with us; and the other important contributors also. In making our highways safe and of maximum use for transportation, we need a well-rounded team of fully cooperating and experienced experts.

Parking Problems

TAYLOR D. LEWIS

Mr. Lewis is Associate Professor of Civil Engineering at Cornell University, Ithaca, New York, and does some municipal consultant work. He formerly was on the Research Staff of the Yale Bureau of Highway Traffic. Professor Lewis' extensive and varied experience in transportation includes work as a Traffic Engineer for the United States Army, as a Traffic Engineer for two cities, as Safety Engineer for an insurance company and as a State Highway Engineer.

ALL OF our cities and towns have been experiencing difficulties in adapting pre-automobile traffic facilities to motor vehicle transportation. The impact of the motor vehicle on the life of our country has been felt since the nineteen twenties and its effect has been revolutionary. Our larger cities were affected first. With their great financial resources, they were able to mount large-scale attacks on the so-called "parking problem." Unfortunately, many of their accomplishments have been followed by increased parking pressure which has often nullified their efforts.

The smaller cities and towns are less affected, but in magnitude only. With their limited resources, they have been able to do less about what to them is a life-or-death problem.

Various other reasons have delayed action until the parking situation in our small cities has reached the explosive stage. For example, artificial restraints placed on the normal development of these cities during the last war have been largely removed. This removal of restrictions has brought for the first time to these small cities the experience of decentralization.

Everyone glibly speaks of the "parking problem," but few realize its full meaning beyond the momentary effect upon themselves. Much has been written about the parking troubles of the large city, but the smaller cities have been left to shift for themselves. The same solutions are not available in the small city, nor would they be justified. Perhaps a statement of the problem is in order.

Statement of the Problem

The parking problem in any town (or small city) consists of the age-old difficulty connected with any transportation system, that of providing terminal space. Unfortunately, motor vehicle transportation is not sufficiently like other transportation means, such as railroads or waterways, to be satisfied by a few terminals centrally located in urban areas. From these central terminals, passengers and freight are expected to remove themselves or be removed to their final destination. The motor vehicle must deliver passengers and freight to a multiple of terminals, all within a congested area. Also the motor vehicle must deliver its passengers and goods directly at or as close as possible to the final and intermediate destinations.

If there were one or two vehicles competing for a terminal space at the same time, there would be little or no problem. But if one side of a city block[1] has eleven retail establishments on the street level and four to five times as many residences and offices above the street level, all competing for nine parking stalls, the problem begins to show.

Parking Demand Exceeds Supply

This typical example shows that terminal space for motor vehicle use is not sufficient to cover the demand. A measurement of demand would, of necessity, be related to two types of parking—curb and off-street—and to the fact that not all persons want to occupy a terminal space at the same time or for the same length of time. Thus we have time demand as well as space demand.

Space Demand: In any town there is a central business district in which retail stores and offices predominate. These businesses group themselves near one another within an area that is usually much less than ten per cent of the total used area of the town. Not only are businesses concentrated in this area, but people naturally crowd into it to carry on these businesses. These people are not all pedestrians, and as small cities and towns lack completely adequate

[1] 100 Block, North Aurora Street, Ithaca, New York (East side).

mass transportation facilities, the bulk of the people must come into this area in passenger cars.

In addition to the people, freight is also shifted in and out by motor vehicles. Many people with many vehicles thus compete with one another for the available parking space, and create within the central business district a space demand. Other spots of industrial or commercial development in town also create a space demand, but these are usually of minor importance.

Time Demand: The requirement for terminal space may be broken up into two parts, the time of day, week, day of week, or season, and the duration of individual demands for terminal space.

Of course the season of greatest demand for parking spaces ordinarily is from Thanksgiving Day to Christmas Day, with local exceptions, such as certain towns during tourist seasons.

The day-of-the-week demand for parking remains fairly constant, with the exception of Sunday, but does build up slightly towards the end of the week. Again local conditions may alter this pattern slightly. If retail grocers offer their week-end specials starting on Thursday, for instance, the parking demand increases considerably on that day.

The time-of-day demand must not be confused with the times parking restrictions are in force. These usually have but slight effect on the demand, and are arbitrarily set in many cases. Parking spaces increase in popularity as businesses open up in the morning and continue to increase until a slight falling-off is experienced at noon. After lunch, the available spaces are again in increasing demand until a peak is reached slightly before the closing time of the offices. The demand then falls off rapidly, until theaters and other places of amusement renew the demand. A final falling-off is experienced around nine o'clock in the evening, and by eleven o'clock, the exodus from "main street" is usually complete.

The time that an average parker stays in a parking space depends largely on his reason for parking. These reasons may be classified into eight groups, explained in the section "Classes of Parking Demand." It is important to determine the *length of stay* and the

number of vehicles which occupy a space in the legal time limit (called turn-over) in order to allocate available space more reasonably. Perhaps by intelligent use of available space, our antiquated traffic system may work sufficiently well to avoid some expensive replanning and reconstruction.

Curb Space: When towns in this country were first settled, it was customary to drive to a destination and leave the horse-and-wagon in front of any place of business. From this practice the idea evolved that a citizen has a "right" to park at the curb, or double-park anywhere or anyhow he may please. This, despite the early English ruling that the King's Highway is not to be used as a stable-yard.

Little by little, restrictions have been placed on curb parking so that the too few spaces to begin with are today being reduced to zero in too many instances. Safety considerations—no parking near intersections, in front of fire hydrants—have removed some curb spaces. The interests of individuals have further reduced the available space, i.e., over-abundant driveways for gasoline filling stations, etc. And finally, the increase in moving traffic has required the removal of curb parking to open up additional lanes for carrying required traffic volumes. The parking problem in the central business district therefore is reduced ultimately to the provision of sufficient properly-located parking spaces to meet the time and space demands. Since there is not enough curb space, we must then turn to off-street parking.

Off-Street Parking: Simple as this solution to the parking problem may sound, it is not simple to do. The first question to answer is "Who is to pay for the facility, the public or private interests?" This question is usually best answered by a combination of efforts. The local situation will govern, rather than general rules. The second question is two-fold, "Where should these facilities be placed, and how big should they be?"

The parking demand always exceeds the preferred supply. Therefore a measurement of that demand should indicate some of the answers to the off-street parking locational design problem. In addition, our town cannot afford large and elaborate parking facilities —simplicity and low cost are imperative.

Bad Effects of Parking on the Town

A parking situation for which no good solution has been found will have a bad effect on the economic life of our small city or town. The indications of trouble are not difficult to find if one looks for congestion and delay, accidents due to parking, inefficient use of available space, and insufficient parking capacity. The bad effects are to be found in decentralization of the central business district, the loss of trade to rival cities, and time and money loss to the public through delay and accidents.

Congestion and Delay: Parking is not in itself the entire or even a major cause in some instances of delay to traffic, but it is often a major contributory cause. The capacity of a traffic lane next to a parked lane is reduced as much as fifty per cent, compared to a traffic lane where parking is prohibited. On streets with only one moving lane in each direction, halting to allow vehicles to park and to unpark, as well as for double-parked vehicles, creates considerable delay. Delay is a loss to the public in time and vehicle-operation cost as well as a source of irritation. In addition, cars cruising to find non-existent parking spaces (cruising storage) also introduce unwarranted congestion and delay.

Accidents: Another cost to the public, chargeable to parking, results from accidents in which a parked, parking, unparking, or double-parked vehicle is involved. The individual damages in this type of accident are not usually very severe, but the frequency with which they occur makes them important. One particularly troublesome type of parking, angle parking, is being eliminated in more and more towns because of the frequent accidents and considerable delay to moving traffic by this type of parking.

Inefficient Use of Available Space: There is nothing more inefficient and undemocratic than to allow a few persons to use parking space far in excess of their fair share. In most of our small cities and towns, there is not sufficient space to go around. Saturation is reached early in the day along the more popular streets but without exception a

certain few persons (usually less than fifteen percent) occupy two to three times their fair share of the available space-hours.[2] Enforcement policies for small cities and towns are less rigid than for large cities, because the public and the city administration are well known to each other, having grown up together, and intermingle socially. It is reasonable, however, to suppose that the public can be educated to provide self-enforcement against such undemocratic practices.

In addition to the "parking-hog", the practice of allowing longer legal time limits than are required by the average parker reduces the turn-over. Business men usually advocate such practice, but they should readily see that to allow a small per cent of their customers to stay beyond the average time will admittedly produce one satisfied customer, but will also produce two or more dissatisfied and disappointed customers who cannot find a convenient parking space. When the average parker remains about thirty minutes (this average includes the overtime parker) it is foolish and inefficient to post a legal time limit of one hour.

Insufficient Parking Capacities: Taking a central business district as a whole, it is seldom possible to prove that there are too few parking spaces. The percentage of occupancy (ratio of occupied spaces to all the available spaces) will be reduced as the area checked is enlarged. One does not expect one hundred per cent occupancy. In fact, seventy-five to eighty per cent occupancy at any one time is just about the saturation point because some spaces must be left vacant for a short time by departing vehicles to provide parking opportunities for entering vehicles.

With larger cities, the central business district is more extensive, and distance from the interior of the saturated area to the unsaturated fringes becomes greater than the average person will walk. Our town or small city may have a few small localities within the central business area, beyond the normal walking distance to available parking. In this case, the off-street lot, either paid or free, comes into the picture.

[2] A typical example—South side of State Street, between Cayuga and Tioga, in Ithaca, N. Y., on 20 June 1949—9.8 per cent of the parked vehicles (overtime) used 28.0 per cent of the available space.

Consequence of Unsolved Parking Problem

Our small city or town pays for its administration by taxing real estate. The central business district usually pays about twenty per cent of the total tax bill. Consequently it is a real threat to the taxpayers as well as to the merchants of the central business district if anything is allowed to take business from this area. The creating of a competing shopping center, with lots of parking facilities outside the municipal limits, effectively increases the tax load on the taxpaying public within the city. With few exceptions, cities are rapidly approaching their maximum growth, and therefore cannot economically stand for decentralization. Even if the new shopping areas are developed within the city limits, the public still loses because of the duplication of services, reduction in central land values, and delay in shifting the tax load.

Where rival towns are located fairly close together, decentralization may be replaced by the shifting of trade from one town to the other. The town that can offer superior parking facilities will be in the best position to attract trade.

Unscientific Approach to Parking Problem

All our small cities and towns have corps of self-qualified traffic experts who leap at the solution of parking problems with great zeal, armed only with personal opinion. When the pressure becomes great enough, action based on this unsupported personal opinion is taken and usually proves expensive and inadequate.

The location, size, and design of off-street parking lots, for example, is a favorite field for action based on unsupported personal opinion. In addition to the "traffic experts," there is the group of persons who fear any change. These persons are unsure of the effect of changes on business and rather than take a chance will block any action. Blocking of action based on unsupported personal opinion is usually a good idea, but plans for changes, even when supported by facts revealed through engineering studies, too many times receive the same treatment. The average business man is usually uninformed on the effect of parking on his business. Being uninformed,

he places far too much value on the parking space in front of his establishment and would rather not see any change. Familiar troubles are less frightening than uncertain results of change.

One common fault in the attempt to improve the parking situation is to abandon or modify a program before a fair trial period is completed because of uninformed or emotional objections from a small but loud segment of the public. Satisfied citizens will not attend a public hearing. Objectors often base their arguments on what they think is an objectionable result of changes in parking when that effect on business can easily be proved to be following a national seasonal trend.

Parking problems, like any other city planning or engineering problem, must be investigated, data collected and evaluated, and the whole situation analyzed, prior to any recommendations for solution.

Classes of Parking Demand

Consumers of parking facilities may be divided into eight homogeneous categories, in considering the small city or town:

All Day—Central Area: The worker in the central business district may come into and leave the area on foot, by mass transportation, or by private motor vehicle. This person demands space from eight to nine o'clock of a morning until five o'clock in the evening, even if he goes home to lunch. He will park as close to his place of occupation as possible, even to the inconvenience of his customers. For example, one study[3] showed that forty-five per cent of the long time (overtime) parkers were employed within one-half block of their curb-parked vehicles. He will arrive alone in his vehicle, or with one other person as a rule.

This class of parker should be accommodated furthest of all from the central area, either at the curb or in off-street lots. Fringe curb parking of this sort is a source of irritation to the residents of the area surrounding the central business district. But other than restricted parking, which simply moves the all-day parker to another similar location, the only reasonable action is to make sure that sufficient

[3] Ithaca, N. Y., 20 June 1949.

free space is left for moving vehicles and for sight distance. Employers should be urged to provide off-street parking lots for their employees simply as a matter of good public and employee relations. Public lots for the small city are not usually warranted for this use.

All Day — Industrial: In addition to workers in retail and business firms in the central area, there are occasional industrial firms that employ large numbers of workers. These industrial firms should provide off-street parking lots for their employees and regulate their use so that employees use them. Curb-parking around such an area is usually troublesome both from a traffic safety and traffic movement standpoint. Some firms have found that parking lots not only reduce lost time by tardy workers but also materially reduce pilferage.

In and Outer: In our central business district, there are some who dash in and out of their offices on calls. Salesmen, service men, professional people, and retail delivery persons are a few in this category. The use of a vehicle is imperative to such a person and that car must be parked close by in order not to waste valuable time. This type of parking demand must be met by providing off-street private space. Such space should be located on the property and often in the interior of the block. The use of curb space or public parking lots for this purpose is inefficient.

Commercial: Under this head comes the mass transportation vehicle, the taxi, local delivery, and long haul delivery. In our town mass transportation vehicles use the curb as their terminals. Loading zone lengths and locations should be determined so as to cause the least possible interruption to moving traffic. Our town is not large enough to require an off-street bus terminal except for inter-city buses.

The taxi or hack stand problem is a sore one with most of the motoring public. Curb space used for private business is not generally conceded to be a democratic practice. Therefore hack stands should be required to provide their own centrally located off-street parking.

Delivery of merchandise to downtown stores over the sidewalk

from the curb causes inconvenience that a progressive town can and should eliminate. With a few exceptions (which should have been controlled by the city planning board) rear door deliveries can and should be made. Plans for opening up the rear door should be made now, so that future buildings and alterations will not block their entrances. Despite police objection that alleys are difficult to police, the interiors of all blocks should be cleared of their ancient trash heaps and fire hazard sheds, and made available for motor vehicle use. Various cities have experimented with curb loading and unloading zones, and also with restrictions on loading and unloading times. These experiments have not been outstanding successes.

Short Time Parker: The available curb space and close-in parking lots should be reserved for the person who intends to make a short stay (under one hour). The regulations should be designed to fit this parking demand. It is not only inefficient but is bad business to require a person intending to stay thirty minutes to spend ten minutes of that time walking from and to his parked vehicle, particularly when the close-in space is occupied by long-time parkers.[4] Half a block is all that should be considered a reasonable walk for this type of parking. A study of most curb parking will show many instances of this unintelligent regulation.[5]

Long Time Parker: Another category for shoppers is the group intending to stay from one to three hours. This vehicle should be accommodated at the curb beyond the short-time parker, and not as far out as the all-day parker, and/or in parking lots. This driver can afford to spend more time walking from and to his parked vehicle, although examination will show that this walking time expressed as a percentage of the entire time will be less than that for the short-time parker. The distance conveniently and willingly walked will vary from city to city, but seven to eight hundred feet is reasonable for a town of the size we are considering. Parking lots for this type of

[4] Recent study in Ithaca, N. Y., showed one third of centrally located curb spaces between 4 and 6 P.M. occupied by merchants or employees.

[5] Ithaca, N. Y., September 1949—Both sides State Street, Aurora to Plain, average time spent by legally parked vehicles, 28 minutes. Posted legal limit, 1 hour. Overtime vehicles took up two to three times their fair share of time.

parker may be, and often are, combined with that of the short-time parker. Turnover in this type lot should average at least one vehicle per space for each sixty minutes.

Amusement Parking: After the normal working day is completed and business parkers have gone, most of the central business district parking spaces are again filled by the "Amusement Crowd." This parking demand overlaps slightly the period devoted to business and extends to the time that the last feature has been half completed at the local theater. This category of parker takes up the curb space and close-in parking space from one to three hours. Since amusement parking does not usually require an increased capacity it does not introduce any additional problems of moving traffic. Control of the parking demand of large crowds attracted to a special event comes under the following category.

Special Parking: Parking problems created by special events such as expositions, concerts, sports events, and parades, are separate and distinct from the usual amusement parking. Permanent arenas and auditoriums should be so located that they can provide nearby off-street parking lots.

Parking problems in connection with funerals come under this head of special parking and are usually well controlled by enforcement personnel working a standard plan. Other special events parking can usually be handled without too much trouble or inconvenience and are not suitable subjects for discussion here.

There is a class of parker, however, under this heading, which we may call the *special privilege* group, that does need attention. This group, composed of officials and semi-officials, need their vehicles in the execution of their duties. These vehicles should be prominently marked in order that their violation of time and space regulations will be at a minimum. This special privilege parking can account for a considerable amount of curb space if allowed to go unchecked. For example, it was found in one city[6] that the police were occupying about twenty curb spaces all day with their private vehicles in the downtown areas.

[6] Gary, Indiana—1939.

Suggested Plan for Action

Merely to discuss the parking problem is not enough. Some plan of action for obtaining relief or a solution should be offered. Such a plan is suggested here.

Our city or town is relatively small but it has some resources that can be turned to good account in the attempt to better the parking problem. Without going into the organization of a typical city administration, we may point out four departments or boards which, with the legislation group, could take on this most important task.

Common Council: The Common Council, as the legislative group and as the elected representatives of the public, has two functions in this situation. The first is to transmit the complaints of the public to the administration so that some definite continuing plan of action may be undertaken. The second task is to receive the suggestions of authorized public groups and convert them into ordinances.

City Administration: The Mayor and his Board of Public Works (or Traffic Commission, if one exists) are in a good position to administer and direct such a program. The actual field work should be done by city employees under the direction of the city engineer; the police could contribute a wealth of experience and observation. All this effort should be coordinated by the Board of Public Works. The reason for proposing the city engineer as supervisor and major planner rather than the police is that his training is better suited to surveys and analyzing data, and also because the police are habitually short of man-power. The work load of the city engineer's office during the construction off-season is usually relatively light.

Separate Boards and Commissions: In addition to these officials, the city organization usually includes a Planning Commission. This group can bring a wealth of data and experience in planning the location and size of off-street parking lots, in preparing and administering zoning ordinances to include parking restrictions and provisions. It is suggested that the existing zoning ordinance be critically compared with model zoning ordinances.[7]

[7] Model zoning ordinances for the State of New York may be obtained from the Division of Planning.

Other commissions and boards in a city's organization, along with various civic groups, should be utilized in the local situation to present a united front in the formation of public opinion as well as to provide informational and technical assistance.

Work Schedule

Our small city must collect and evaluate parking data prior to proposing changes. One of the first steps in this operation is to find out what exists, and to follow this by necessary studies.

Inventory: The district to be investigated should be defined and a map prepared showing: (a) curb space available for parking; (b) restrictions on curb space, both NO PARKING and time restrictions; (c) off-street parking space available for parking; (d) cost for such off-street parking; (e) street widths and curb radii at intersections; (f) condition of signs, etc., to be noted as a separate study; (g) special traffic generators, such as super-markets, post office, banks, etc.

Accidents: Those accidents involving parked, parking, or unparking vehicles should be plotted on a spot-map and an accident-facts summary prepared.

Ordinances: The restrictions on parking set forth in the Traffic Ordinance should be plotted on a map. Those variances from the ordinance actually found in the field should be indicated. Other ordinances on parking and handling of violators should be noted. Local ordinances should be compared to the Model Traffic Ordinance,[8] and actual procedures and policies of the enforcement and court agencies should be checked.

Studies: Some basic studies should be accomplished. (a) The first of these is the *occupation of curb space*. This study is simply to make a morning and afternoon tour of the district and note which spaces are occupied and which are vacant at any one time. The off-street spaces are similarly checked. From this data, a saturation map pre-

[8] Model Traffic Ordinance. U. S. Government Printing Office.

pared for each side of the street for each block will show the existence or non-existence of a parking capacity problem.

(b) The second should be either a complete or a sampling study of *the time each vehicle remains parked.* From this data, a map or chart can be prepared showing the time demand (including average times, turnover, and violations) for parking. A comparison of the time demand and the actual time restrictions will indicate required changes. The character of enforcement of the regulations will also be revealed.

(c) The third study should be directed to *improving the movement of vehicles.* Necessary data for this study are width of streets, existence of parking, vehicle volumes for peak periods of the day, and speeds and delays encountered. The major item is to determine whether parking must be eliminated in order to move traffic. The use of one-way streets will in many instances save curb parking. But where parking is eliminated, at least that same amount of parking should be provided off-street in the immediate neighborhood. The elimination of hazards due to parking are a special part of this study.

(d) The last study is a combination of studies to indicate *location parking desire.* Cordon counts will indicate the total demand for parking at any one time; origin and destination studies will indicate the area of destination or terminal, and parking interviews will indicate to some extent the desires of the public for both terminal location and length of stay. The small city or town is not in a position to secure on its own either the cordon count or the origin and destination study, but can accomplish the parking interview on a sampling basis. Care must be exercised in order to obtain the data required in a simple way.

Analysis: Only when all data are assembled and analyzed can an intelligent program of parking improvement be realized.

Many other methods and courses of action may be followed to the same conclusion, but for simplicity's sake, this course is recommended. Our town is not large enough to hire a full-time city planning and traffic engineer and we cannot support a Parking Authority. But we can use our own resources of planning and engineering skills to attack what is today a major problem in our small cities.

Enforcement and Traffic Control

HOMER GARRISON, JR.

Since 1938, Colonel Garrison has been Chief of the Texas Rangers, the oldest State Police organization in the world, and Director of the Texas Department of Public Safety. He has been a law enforcement official for more than half his life, starting at 19, over 30 years ago as Deputy Sheriff in the piney woods of East Texas. He joined the Texas Highway Patrol when it was organized in 1930.

Colonel Garrison is a Past-President of the International Association of Chiefs of Police and a Life Member of the Executive Committee; a Past-President of the Texas Police Association; former Chairman of the Traffic Section of the Police Division of the National Safety Council; a Past-Member of the Police Advisory Committee to the Secretary of Defense, and for the past two years he has been Vice-Chairman of the Enforcement Committee of the President's Highway Safety Conference. For five years he was Instructor of Police Cooperation in the FBI Police Academy in Washington.

TODAY, almost every person who is not a bedridden invalid discusses the "traffic" problem. In many cities and sections of our country, this discussion has brought about constructive, fruitful action aimed at solving the problem. In others the result has been about the same as Mark Twain's quip on the weather, "Everybody talks about it and nobody does anything about it."

To some persons, the problem of traffic is finding a parking place at the post office, the long wait at the traffic light, or the loss of time in the snail-like pace of the river of motor vehicles on some major thoroughfare, reducing the effective speed of shiny, new, one-hundred-forty-horsepower automobiles to the pace of old Dobbin of grandfather's day. Some business men with locations in the downtown section of our major cities realize more serious aspects: strangulation of that area of the city with its consequent loss of business to them, depression of property values with its attendant loss of revenue to the city and other taxing bodies, with all the economic ramifications that this loss brings about.

Thinking people, with a knowledge of the facts recognize a still more serious aspect of the problem in the staggering loss of lives,

property, and economic resources exacted through traffic accidents in this country annually.

Thanks to the work of the President's Highway Safety Conference of 1946 and subsequent years, there is emerging, for all who will see, a clear-cut picture of the true problem: "How to provide an efficient (safe, rapid, economical) motor vehicle highway transportation system for this country?" Considered as a problem of solution, it could be phrased as "How to provide better management for the motor vehicle highway transportation system in this country?"

President's Conference Offered Program

These questions might well have posed such a monumental problem as to defy solution if the President's Conference had not been able to pool the thinking and conclusions of the vast number of people in this country who were working toward a solution in all the varied areas of activity. This it did. From that conference came a balanced program whose elements are: Laws and Ordinances, Accident Records, Education, Enforcement, Engineering, Motor Vehicle Administration, Public Information, and Organized Public Support.

In each of these areas or elements, the committee for that area of activity rendered invaluable service by answering the questions of "What?", "Who?", and "How?" That is, defining what must be done in each area, setting out who shall do it, and prescribing how it shall be done, with standards of achievement. This service has permitted every agency concerned with traffic to see itself in proper perspective in relation to the problem and in relation to the other agencies engaged in the same area of activity or any of the other elements of the program.

The Committee on Enforcement of the President's Highway Safety Conference describes the agencies of enforcement as the police and the courts. The basic function of the police in traffic work is defined as "traffic supervision," made up of three activities:

Directing Traffic means:

(a) Answer questions, especially about local traffic rules and how to reach places or routes.

(b) Indicate to drivers and pedestrians what to do and what not to do, especially when and how to move at a congested point wherever and whenever hazards and congestion make the use of streets and highways dangerous or difficult.

(c) Make emergency rules for the flow of traffic when the usual regulations prove inadequate or when special regulations have not been made to meet unusual or unexpected traffic conditions.

Investigating Accidents means:

(a) Take action needed to keep accidents from becoming worse after they have happened. It includes giving first aid, protecting the scene to avoid additional pile-ups, preventing fires, theft and other such activity.

(b) Find out what happened.

(c) Decide why the accident happened.

(d) Record and report the facts and conclusions.

Traffic Enforcement means:

(a) Detect, in connection with street or highway use, pertinent defects in individual behavior, vehicle equipment or roadway condition.

(b) Start appropriate action at once to:

(1) Prevent such defects from causing accidents or delays;

(2) Remedy the defects, and

(3) Discourage their repetition.

(c) Record all such activity.

(d) Help in the trial and punishment of traffic law violators by cooperating with prosecutors, testifying, and serving warrants.

Traffic law enforcement may be defined as all the activity involved in the detection, apprehension, and punishment of violators of the traffic law in order to serve as a deterrent to all potential violators. Its objective is to secure voluntary compliance with the traffic regulations by all users of the streets and highways. This goal of course depends upon the effectiveness of the deterrent.

The basic function described above adequately portrays the police as occupying, with the courts, a niche in the overall picture with eight other elements. However, work of the police and the

courts has a broader aspect. Let us see what contributions they make to other agencies in the administrative areas of laws and ordinances, accident records, education, engineering, motor vehicle administration, public information, and organized public support, and what their effect is upon the activities in those elements of the overall control program.

In the area of laws and ordinances, it is trite to say that there would be no need for such enactments prescribing or forbidding defined behavior or conditions unless they were made meaningful and made to serve society through action of the police and courts. Indeed, each complements the other. Without proper laws to enforce, the police and courts are impotent; and without action by the police and courts, the best of laws become hollow mockeries.

Police Reports Provide Facts

Accident Records might well be likened to a saw mill which furnishes to the educator, engineer, and police, the finished lumber (facts) with which to build his house of safety. Any effective program aimed at any aspect of the traffic problem must be based on facts. Accident Records must provide those facts, tabulated and analyzed, in usable form. Where does it get the facts? Where does the agency obtain the raw material for the finished product? Basically, it must come from the police through police reports. Obviously the police and courts stumble blindly without the guidance of the facts from accident records, but the police must first furnish the raw material, police reports, from which the facts are derived.

When we consider the educator's contribution to traffic betterment, it is obvious that his training becomes a farce unless supported by enforcement. He becomes a siren leading his deluded followers to certain destruction unless his teachings are supported by effective action from enforcement. The anti-social group must be curbed in society for the educator's work to be effective. With thousands blithely ignoring his teachings with impunity, his only followers will be that small segment of society aptly described as "Mr. Milquetoast," those who obey a regulation because it is a regulation.

Engineering can make and has made a great contribution toward

the solution of the traffic problem. Economic limitations only have prevented that contribution from being immeasurably greater. Yet without the active support of the police and courts, much of the present effect achieved through such developments as signs, signals, traffic circles, channelization, one-way thoroughfares, parking regulations, speed zoning, and many countless others, would be largely nullified. The experience on the Pennsylvania Turnpike proved that traffic supervision by police is a necessary complement to the finest of engineering.

In the area of Motor Vehicle Administration, it becomes trite to say that driver licensing, motor vehicle inspection, financial responsibility programs, and motor vehicle registration and title activities depend upon enforcement support or they become wholly ineffectual in achieving even a modicum of their desired effectiveness. This fact is obvious even to the wholly uninitiated.

Enforcement makes a like contribution to other elements. Because enforcement is recognized as a tool that will achieve immediate results in accident prevention, many times it has been given the whole task of dealing with traffic. Consequently a police agency, willing to accept its responsibility, has assumed duties and responsibilities that it could not possibly discharge; and, judged by results, it has failed. We, in police service, must see in proper perspective our basic function, traffic supervision, in its limited scope and in proper relation to the other functions and activities necessary to the official program. Then we must discharge our responsibilities to the best of our ability, recognizing that our specific role of activity is limited but that it influences all of the other areas of control and each agency operating in them.

Officials of governmental subdivisions charged with the responsibility of providing an official traffic control program for the citizenship of their jurisdictions must realize that maximum effectiveness can be achieved in that program only through the full utilization of all the agencies and functions prescribed in the separate elements of the program, closely coordinated and integrated.

Further, they must recognize that the effectiveness of their enforcement program, as carried out by the police and the courts, depends on the performance of the other agencies. For we know that

no matter how skillfully blended are the other factors, the entire structure of traffic control depends upon the vital element of police enforcement.

To those governmental officials, legislative and administrative, who have through their constructive leadership brought such a balanced program to their communities, have come the rich rewards of lives saved and economic loss reduced. Their example should inspire us all.

The Relation of Traffic and Parking to Retail Business

WILBUR S. SMITH
Technical Advisor, The Eno Foundation

RETAIL business is dependent upon the street transportation system. Capital values are at stake. The importance of traffic to retail trade is unquestioned. Business cannot exist without customers. People, many people, make property and business values. The people must be congregated, but they don't like to walk, so they must be transported.

In practically all cities, except the largest, a substantial portion of retail customers elect to use automotive transportation; others would prefer it. The automobile is even disproving the old idea that "people must become pedestrians before they are potential customers." It is a simple axiom, therefore, that to attract people to an area, you must attract motorists. And to attract motorists it is necessary to provide non-congested routes and convenient terminals.

Few cities can accommodate the motor vehicles that are coming or desire to come downtown from the areas surrounding the central business district in a manner that is at all suitable to the drivers. This failure develops a competition between cities and between different areas of a given city. Customers seek *values* and *convenience,* but the successes of new shopping centers indicate that *automotive conveniences* have become the major requirement. Continued attempts to withhold traffic and terminal facilities are sure to starve business in many vital districts. On the other hand, it is not easy to correct the problem.

Since 1945, automobile registrations and uses have grown at phenomenal rates. The number of vehicles has increased 58 per cent and travel has grown 56 per cent. We now have about 48,500,000 motor vehicles operating 450 billion miles per year. Barring restrictions, it is impossible to forecast what values the future will produce. The problem is already tremendous and it doesn't appear to be approaching maturity.

Why No Greater Success

Since conditions are so bad, let's look at some of the reasons why. There are many. They involve historical, social, and economic factors which together become extremely complex. In this discussion, consideration is given primarily to those factors which directly involve immediate areas of interest of the retail merchant and the traffic authority. Some parts of the discussion may appear critical, but every attempt has been made to avoid biases.

Merchants want good traffic and parking facilities, but often they are unwilling to do much to achieve them. There is likely to be found an attitude of: "Leave good enough alone. We are making a profit, so why gamble with changes?" Why do so many merchants resist anything that's new in traffic?

To traffic officials, especially traffic engineers, the attitudes of many merchants are difficult to understand. They just can't resolve the oppositions to traffic changes which they know are sound—both from public and business viewpoints. Often progressive improvements are defeated by persistent opposition of merchants. The opening sentence of a recently published article typifies the situation: "Acting under pressure of a well-organized group of shopkeepers, who claimed that they had suffered a 20 per cent loss in business because of one-way streets in front of their shops, the . . . City Council . . . voted to return the two streets to two-way operation." Yet, the local traffic engineer knew that the one-way streets served a greater number of people and thereby more potential customers. He knew the regulation made the downtown district more accessible and the properties therein potentially more valuable.

The matter of one-way streets suggests many examples of unjustified merchant opposition. When the regulation was applied in a large city on the East Coast and in another city in the West, many merchants complained that their business had been severely damaged. In one of the cities, the opposition caused a basic portion of the one-way plan to be rescinded.

Traffic engineers made sales tax studies for both cities and found no negative results growing out of the one-way streets. Establishments on those streets enjoyed better business when the regulations

were in effect than similar businesses on other streets. In other words, the merchants either falsely claimed injury, or they blamed the one-way streets for a decline that was due to some other cause.

In another city, the merchants assumed a very obstinate position and opposed a pair of one-way streets without factual basis. They advanced such silly arguments as to produce a public rebuttal in the press. They were told in no uncertain terms that "to the average citizen, there is nothing sacred about the downtown district." Doesn't this suggest that the merchant should be sure of his claim when traffic changes are opposed?

Another case is known where several one-way streets were adopted to ease a serious congestion problem. Merchant opposition centered around the argument that with the one-way streets traffic moved so fast in the downtown area that motorists wouldn't stop to trade!

One-way streets are not the only traffic improvement opposed by some merchants, but the general views are likely to be the same and are apt to be just as ill-founded as in the cases cited. Traffic experts know that they must use one-way streets, improved signal systems, turn controls, through streets, pedestrian regulations, curb parking restrictions, transit routing, commercial vehicle controls, and other devices to get the maximum efficiency from existing street systems. (Use of those expedients becomes more important as defense activities curtail metals and other materials essential to the construction of new facilities. Existing facilities must be made to serve both the existing trouble as well as that which might be created in connection with essential war efforts.)

It is also realized that long-range physical improvements must be developed and supported in every community. Traffic improvements and plans must be integrated with city planning and other allied activities. However, the needed support of merchants for all these is often not forthcoming, and the traffic program is hindered rather than aided.

If we have the merchants on trial, as it might appear, then we should hasten to explain that the public officials and traffic experts are often not in court with "clean hands." City and state authorities make mistakes in traffic matters too. They may recommend and in-

stall controls, regulations, and facilities that are unsound. They may thereby unduly penalize business. While it is impossible to achieve many traffic improvements without having a few suffer damages to benefit the body politic, such damages should be kept at the minimum compatible with overall improvements needed. Public authorities must include economic factors in their studies of traffic treatments and street developments. Often a compromise is desirable.

Some mistakes in viewpoints about traffic are chargeable to ignorance. Problems are developing so fast and changing so rapidly that there are often inadequate precedents on which to base decisions. It is generally known how incorrect were early by-pass theories. Only after many errors, were the true facts learned about the location of by-passes and their effect on business. Progressive merchants no longer associate a high business index with chronic traffic congestion.

Word is gradually getting around that simultaneous signal systems (all signals showing same color along a given street) are not the best "just because they are used in New York City." In many ways it is being learned that the basic desires of individuals cannot be changed; they must be met if success is to be achieved. And so, almost every day we learn something new in traffic.

It is apparent that both merchants and traffic officials are guilty of many errors which hamper urban traffic improvements and which are detrimental to retail business, especially those in downtown districts. The best way to overcome this condition is to have both groups utilize more thorough and comprehensive traffic and business facts. This requires qualified traffic personnel for each city and an understanding and willingness on the part of merchants to cooperate and support a progressive traffic program.

What Can be Done About Traffic and Parking

As already indicated, consideration must be given to both parking and traffic movements. The parking problem requires development of off-street facilities; many approaches are available. Traffic move-

ment is aided by the various control devices and regulations already mentioned and by provision of new or improved roadway facilities. Since the ways of increasing flow are so obvious and have already been briefly discussed, attention is turned to parking.

When curb use restrictions are applied to expedite movement, the need which already exists in retail centers for off-street parking is greatly amplified. The question of responsibility for providing the facilities is first raised. At least, the Federal and State governments have decided it is a local responsibility. Locally, some contend that it is a public responsibility from which the citizens are the principal benefactors, that it is an integral part of the street transportation system, and that it should, therefore, be developed by the city. Others argue that the problem is generated by land uses, that parking is necessary to the success of business, and that it is the responsibility of business to meet the demands.

Still others feel that the problem is one for joint action. And a few simply look at it with indifference and complete disinterest. Fortunately there are fine examples of success under many different plans. Even though an agreement cannot be reached as to responsibility, success can be achieved, with proper leadership and support, under a variety of methods. Consider the following examples.

Collective actions of business groups have produced notable parking developments. One of the best known is the plan of the Downtown Merchants Parking Association of Oakland, California. Formed in 1929, this agency has developed seven parking stations (lots) at strategic locations in the downtown area, serving more than 1,500,000 parkers a year. Properties are leased and improved, with improvements amortized over the period of the lease. An hour of free parking is provided customers of Association members when they have tickets validated—such validation does not necessitate a purchase in the store. Rates are: one hour free if ticket is validated; unvalidated tickets 10 cents; second hour 10 cents; each additional hour 15 cents. The costs are pro-rated monthly among members. Currently the cost to merchants averages 2.5 cents per validation.

Huntington, Long Island business men organized a non-profit business corporation to acquire parking areas for lease to the town

for a period of ten years. The annual rental is 10 per cent of the cost plus taxes and insurance, the rental to amortize the principal; and the areas to be deeded to the town at the end of the ten years. In effect, the merchants financed the parking with interest-free money.

A similar development occurred in New Brunswick, New Jersey. A public parking authority proposed facilities to be financed by benefit assessment bonds. As an alternative, the merchants agreed to purchase interest-free bonds to finance the parking facilities; and the program has proceeded on this basis.

The plan of Allentown, Pennsylvania has recently received wide acclaim. Five years ago, merchants and property owners joined to acquire and operate lots for their customers, under a plan titled PARK AND SHOP. The group now has assets of almost one-quarter million dollars, controls about a thousand car spaces, and serves a third of a million cars per year. Customers can have tickets validated; others pay reasonable parking fees. Much success has been achieved and the plan is being extended.

Actions of individual investors in off-street parking are numerous. Recognizing the importance of the automobile to successful merchandising, many stores have provided large and well-equipped facilities for accommodation of customers. Everyone is familiar with the policy of nationwide stores such as Sears-Roebuck, the A & P, and others.

Developments which have been widely reported include the garages of F & R Lazarus Company of Columbus, Ohio; Rich's at Atlanta, Georgia; Foley's of Houston, Texas; Shillito's of Cincinnati, Ohio; the Cafritz Building, Washington, D. C.; Hecht's of Washington and Baltimore; and the General Petroleum Corporation garage in Los Angeles.

The efforts of private investors in lots and garages should not be overlooked. Many of the most successful operations are these. They have no direct association with other business developments, but they play an important role in the downtown parking picture.

Finally, there are the examples of action by cities. Miami Beach, Florida, has developed an extensive system of lots from revenues derived from parking meters at the curbs and on the lots. Greens-

boro, North Carolina has a similar plan. Grand Rapids, Michigan has sold bonds to build a garage. Revenues are to come from the garage, but parking meter receipts are also pledged.

Bluefield, West Virginia has constructed a municipal garage with money derived from general revenue bonds. Pittsburgh, Pennsylvania, has an active parking authority which has just completed an extensive plan for garages to be financed from revenue bonds. Public officials in Providence, R.I. are about to launch an extensive plan.

The actions of cities in using local zoning powers to require the development of off-street parking as a part of new buildings cannot be overlooked. More than 200 cities now have such regulations; most of them were enacted within the past five years.

Many other cities are active in the parking field. Some are developing lots and garages directly, others are creating commissions and authorities, granting them broad powers to acquire property, to erect structures and to operate the finished facilities. Some cities have hesitated to develop parking under city ownership, but are cooperating with, and aiding private developments.

The work of Baltimore's parking commission in financing and otherwise aiding private development is well known. Washington, D.C. encourages and aids private development and is now planning studies aimed at accelerating the overall program. In Boston, it is reported that the historic Commons is being leased for development of a large underground garage.

In parking, progress is being made. Experiences are being gained. The need now is to accelerate the pace! Support of merchants is essential and the outstanding contributions of local Chambers of Commerce and Merchants' Associations can be cited in practically every successful program.

How T and P Improvements Benefit Business

The exact degree to which parking improves business is difficult, if not impossible, to measure. Too many factors are involved, and too few comparative data have been collected. Changes usually take place as a slow evolutionary process and cannot be ascribed to any one

thing. Increased sales and increased property values are indicative of achievement, but these always involve other factors than traffic. Many statements are available to the effect that business was better after traffic and parking improvements, but factual data or percentage claims are few.

Business trends in New Canaan, Connecticut have been related to those of nearby cities in an attempt to show the effects of off-street parking. When retail sales figures are compared, it is reported that New Canaan is doing much better than the other cities of comparable populations. A principal reason for the achievement is credited to off-street parking developments in New Canaan. New businesses are being attracted and property values are increasing as word spreads that the town is a good place for *motorists* to shop.

Reference has already been made to comparative sales tax studies which show how business was improved when street congestion was alleviated.

A recent study in the New York Metropolitan region of 84 cities indicates that city-constructed parking facilities have invariably produced increased business in areas affected. Land values have also been increased. Fewer than 20 per cent of the parking facilities covered by this study charge a fee.

Before a 400-car lot was developed in Kalamazoo, Michigan, there were several vacant stores in the benefit district. Within one year after the lot was opened, all properties were occupied; one increased in value from $12,000 to $25,000 and another from $2,500 to $12,000.

Studies at one store with a lot in the rear showed that 65 per cent of the trade entered from the lot door.

Developers of the well-known Country Club Plaza Shopping Center in Kansas City state that they "are certain that parking has been the foundation for success."

Increases in tax rates were stopped and business losses were recovered when merchants in Santa Ana, California decided to validate tickets for parkers in nearby lots.

With both parking and congestion, the "proof of the pudding is in the eating," or "Nothing succeeds like success." Parking facilities are not extended unless it is profitable, and new traffic improvements

are not supported unless prior ones have brought benefits. The benefits are hard to measure, but they are none-the-less real.

Merchants' Assistance Essential

When a traffic engineer and other public officials can get organized, progressive support from the local merchants for a traffic and parking program, they are fortunate. There are a few cases in which success is achieved in spite of merchants' resistance, but the most outstanding achievements are in those cities where the retail groups back the program. Efforts of merchants (evidenced through actions of their own association, The Chamber of Commerce or other local organizations) are so determined in some cities that they are pushing forward improvements with little or no aid from public officials.

Progressive, and even bold actions are required. The merchants can wield an important weight in making them possible. They have a tremendous stake in the soundness and vitality of the city and they can help greatly with traffic improvement programs that are required to attain that objective. The time has come when the urban traffic problem cannot remain status quo. It must either be improved or the area will suffer from a self-inflicted illness.

The remedies are known, but their attainment is not simple. They require the services of technicians; their applications must be based on facts; and there must be sustained backing.

General Conclusions

From this discussion, and from broader considerations, it is possible to draw conclusions relative to the relation of traffic and parking to business. Perhaps it would be more correct to think of the conclusions as items to be considered in order to effect traffic and parking improvements essential to sound business conditions.

1. Easy use of the automobile is one of the principal *conveniences* demanded by retail customers.

2. Too often a traffic regulation is blamed for a drop in sales when the fault is elsewhere.

3. The failure of merchants to support local traffic programs

usually means inefficient traffic which becomes so congested and hazardous as to repel customers.

4. The traffic and parking programs must be supported as *community* activities. Competitive views must be buried.

5. It often takes a strong shift in business development or a marked drop in property values to get action started. Sometimes it is too late and actions taken are incapable of stopping movements or trends already well under way.

6. Businessmen must become as interested in obtaining facts about traffic and their business as are the traffic professionals. Otherwise, hopeless arguments and oppositions will continue to damp all action programs.

7. Attempts should be made in each community to agree on responsibility for off-street parking, so that a fixed policy can be announced and vigorously sponsored.

8. It is believed that business would be wise to assume responsibility for providing parking spaces for the demands their enterprises generate. It should include commercial vehicle loading facilities. This will certainly be the quickest and safest approach. Parking can be considered ancillary to the basic business.

9. Looking solely to City Hall for parking developments is taking a narrow view. All concerned must be willing to accept controls if this view is pursued too far. However, city support can normally be expected for a sincere and logical program of parking improvement.

Traffic and parking problems can be solved, even though they require great effort and expense. No group has a greater responsibility for their solution than the retail merchants. They can properly develop the interest, leadership, and support that are required in every city.

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